ANTIMICROBIAL PRESCRIPTION TRENO AND DIRECT COST ANALYSIS OF VARIOUS DRUGS PRESCRIBED FOR BRONOFE PNEUMONIA

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APRIL 2014

PHARMACY PRACTICE

INTRODUCTION

Bronchopneumonia remains a common and serious illness, in spite of the availability of potent new antimicrobials and effective vaccines. In world pneumonia is the sixth leading cause of death, and the number one cause of death from infectious diseases because pneumonia is not a reportable illness, Pneumonia is increasingly being recognized amongpediatric and geriatric patients and those with co morbidity Such illnesses include chronic obstructive pulmonary disease, renal insufficiency, congestive heart failure, diabetes mellitus, coronary artery disease, malignancy, chronic neurologic disease, and chronic liver disease. The patients may become infected with a variety of newly identified, or previously unrecognized, pathogens. At the same time, a number of new antimicrobial agents have become available, some with utility for bronchopneumonia. Paralleling the improvement in our antibiotic armamentarium has been the evolution of bacterial resistance mechanisms.

EPIDEMIOLOGY

Pneumonia is a common illness affecting approximately 450 million people a year and occurring in all parts of the world.pneumonia is not a reportable illness, Pneumonia is increasingly being recognized among pediatric and geriatric patients and those with co morbidity Bronchopneumonia remains a common and serious illness, in spite of the availability of potent new antimicrobials and effective vaccines. In world pneumonia is the sixth leading cause of death, and the number one cause of death from infectious diseases because Such illnesses include chronic obstructive pulmonary disease, renal insufficiency, congestive heart failure, diabetes

mellitus, coronary artery disease, malignancy, chronic neurologic disease, and chronic liver disease. The patients may become infected with a variety of newly identified, or previously unrecognized, pathogens. At the same time, a number of new antimicrobial agents have become available, (Kollef, M. H,et al., 1998)

Health Organization estimates that one in three newborn infant deaths is due to pneumonia. Approximately half of these deaths can be prevented, as they are caused by the bacteria for which an effective vaccine is available.In 2008, pneumonia occurred in approximately 156 million children (151 million in the developing countries and 5 million in the developed countries). In 2010it resulted in 1.3 million deaths, or 18% of all deaths in those under five years, of which 95% occurred in the developing countries. Countries with the greatest burden of disease include: India (464illion), income countries China (21 million) and Pakistan (10 Countries with the greatest burden of disease include: India (464illion), income countriesChina (21 million) and Pakistan (10 million). It is the leading cause of death among children in low. Many of these deaths occur in the newborn period. The World Health Organization estimates that one in three newborn infant deaths is due to pneumonia. Approximately half of these deaths can be prevented, as they are caused by the bacteria for which an effective vaccine is available.

DEFINITION OF BRONCHOPNEUMONIA

Bronchopneumonia can be explained as a clinical condition of respiratory tract, which connected with the lungs. It commonly refers to people who had pneumonia and whose situation wasn't so bad and they have been treated at home itself .However in the progress of the illness bronchopneumonia should be treated in

hospital. (Luna, C. M,et al.,1997) .It affects millions of people every year all over the world and especially in the developing countries

HISTORY OF BRONCHOPNEUMONIA

and it reflected the extent of medical knowledge through the Middle Ages into the 19th century.(Mandell, L. A,et al.,2003).

Symptoms that are more accurate was given by Moses ben-Maimon, a Jewish philosopher and physician. He was born in 1135 in Spain. Most of his famous works are based on the Jewish law and ethics. However, Moses ben-maimon wrote ten medical works originally in Arabic, which was later translated to Hebrew and English. In these works, he gave a much more precise description of pneumonia, which is For the study I have collected 462 bronchopneumonia prescription, and dates from two hospitals.After collecting prescription to check the prescription according to standard guideline. From the prescription I separated patents demographics data such as gander wise distribution, alcoholic distribution, smoking wise distribution ,age wise distribution ,hospital wise distribution and anti microbial prescription wise distribution data's. From the prescription I collected patients medical cost, and separately oral cost injections rate, evoheller cost and total medical cost. Also collected non medical cost such as laboratory tests cost ,nursing cost ,travelling cost ,in case of inpatient I collected hospital room cost also then prepared non medical cost of each and every patients and recorded it .I collected total medical cost of bronchopneumonia from additions of both medical and non medical cost. Bronchopneumonia is one the infectious disease and I find number of

days of medical treatement, and average of prescription per day. Finally differentiate type of antibiotics prescribed for the patient's ant its total.

technically similar to the modern definitions of the disease

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In 1875, Edwin Klebs, a German-Swiss pathologist, first observed the bacteria in the airways of patients who died due to pneumonia, which was later used to discover the culprit of the disease. He was born on February 6th, 1834 in Switzerland. He attended the University of Würzburg and later received his PhD from the University of Berlin. He completed his residency from the University of Konigsberg. He served as the professor of pathology and taught at various medical universities including in Switzerland, Würzburg, Prague, Zürich and the United States. He also served as a physician for the Prussian Army during the Franco-Prussian War. To honor his work, bacterial genus Klebsiella was named after him. He died on October 23rd, 1913 in Switzerland.(ferriere.s,et al.,2002) The two most common bacterial causes of pneumonia are Klebsiella pneumonia and Streptococcus pneumonia, which was identified by Albert Fränkel and Carl Friedländer in the year of 1882.

Sir William Osler, known as medicinethe father of modern,appreciated the death and disability caused by pneumonia, describing it as the "captain of the men of death" in 1645as it had find out sis which was one of the leading causes of death in that time. This phrase was originally coined byJohn Bunyan in reference to usage of o described pneumonia as "the old man's friend" as death was often quick and painless when there were slower more painful ways to die.

Lot of findingsn the 180s improved the result with pneumonia. With the advent of cephalosphorins andics, modern science ues, In 21ste care in the century, mortality from pneumonia, dropped precipitously by 30% in the developed countries. Vaccination of infants against neumonia type B began in 1988 and led to a dramatic decline in cases shortly thereafter. Vaccination against Streptococcus pneumoniae in adults and children and in children in 2100, resulting in a similar decline. (ferriere.s,et al.,2002)

COMMON SYMPTOMS OF PNEUMONIA

The firstIrrespective of the severity and causative organism the difficulty in breathing symptom is commonly observed and foremost symptoms associated with the pneumonia are the difficulty in breathing. The intensity of the pain in breathing directly related to the intensity of infection Irrespective of the severity and causative organism the difficulty in breathing symptom is commonly observed with all pneumonia patients. The intensity of the pain in breathing directly related to the intensity of infection. (Ibrahim e h,et al.,2000)

In not only this ther typical symptoms of pneumonia are fever, cough, cold, felling tierdness time muscular pains. the fever and cold is a common symptoms to every diseases, in case of pneumonia the fever will persist throughout the period. A proper medication can avoid all the above inconvenience.

Pneumonia also fes affects the defense system of the body. In pneumonia remains inside the body for a longtiout it poses a threat to affect the immune system of the body. In fact if proper medication and care is not being taken in the right time it will

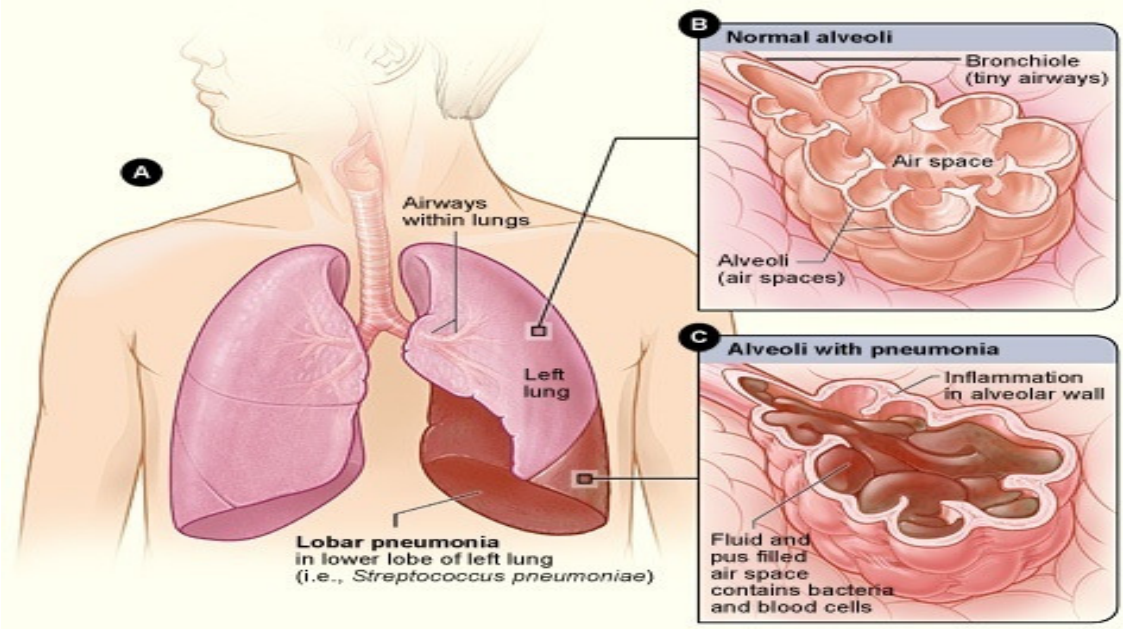
lead to fatal. Pneumonia iss advised to treat the pneumonia at the early stage so that the chance of spreading can be abolished.

Pmeumonia serious illness, in spite of the availability of potent new antimicrobials and effective vaccines. In world pneumonia is the sixth leading cause of death, and the number one cause of death from infectious diseases because pneumonia is not a reportable illness, Pneumonia is increasingly being recognized among pediatric and geriatric patients and those with co morbidity Such illnesses include chronic obstructive pulmonary disease, renal insufficiency, congestive heart failure, diabetes mellitus, coronary artery disease, malignancy, chronic neurologic disease, and chronic liver disease

It is noteworthy to mention that if the pneumonia seen with a new born baby, immediate medication should be started without any further delay. As the new born babies does not have enough resistant and immunity the treatment should be started with no time. (kumar a. at el.,2006)

When pneumonia also feect babesdevelop symptoms like vomiting, high fever, cold, cough and difficulty in breathing.

It has also been noticed that some of the patent suffering from pneumonia has reported the complaint of chest pain while breathing deeply. The major cause behind the chest pain is the accumulation of pus and fluid inside the air alveoli. The pus and fluid obstruct the path of breathing and it result the pain in chest. (Ibrahim e h, et al.,2000)



Courtesy (Adams)

TYPES OF PNEUMONIA

There are three types of pneumonia they are

1. Community-Acquired Pneumonia
2. Hospital-Acquired Pneumonia

   And finally

3. Health Care-Associated Pneumonia

Community acquired pneumonia

community-acquired pneumonia often present withdyspnea, rigors, and pleuritic chest pain cough, fever, chills, fatigue, dyspnea, rigors, and pleuritic chest pain. a patient with suspected community-acquired pneumonia,(luna c.m et al.,1997) the physician should first assess the need for hospitalization using a mortality prediction tool,combined with clinical judgment. Consensus guidelines

from several organizations recommend empiric therapy with macrolides, fluoroquinolonesh as the Pneumonia dosagex, , or azithromycin Patients who are hospitalized wouldd be switched from injection .anti biotcs antibiotics after their symptoms improve, they are afebrile, and they are able to tolerate oral medications. hospital pathways was important deviceto improve care and maximize cost-effectiveness in in patient with hospita atera.et al.,1997)Community-acquired pneumonia (CAP) is defined as pneumonia not acquired in a hospital or a long-term care facility. Despite the availability of potent new antimicrobials and effective vaccines,1 an estimated 5.6 million cases of CAP occur annually in the United States.

Typical pneumonia usually is caused by bacteria such as Streptococcus pneumonia. Atypical pneumonia usually is caused by the influenza virus, mycoplasma, chlamydia, legionella, adenovirus, or other unidentified microorganism. The patient's age is the main differentiating factor between typical and atypical pneumonia; young adults are more prone to atypical causes, and very young and older persons are more predisposed to typical causes.(kollet,m.h et al.,1998)

Clinical presentation

Pneumonia is an inflammation or infection of the lungs that causes them to function abnormally. Pneumonia can be classified as typical or atypical, although the clinical presentations are often similar. Several symptoms commonly present in patients with pneumonia.

Symptoms

Common clinical symptoms of Community-acquired pneumonia(CAP) include cough, fever, chills, fatigue, dyspnea, rigors, and pleuritic chest pain. Depending on the pathogen, a patient's cough may be persistent and dry, or it may produce sputum. Other presentations may include headache and myalgia.(mandell,l et al.,2003) Certain etiologies, such as legionella, also may produce gastrointestinal symptoms.

DIAGNOSIS

Physical examination

Physical examination may reveal dullness to percussion of the chest, crackles or rales on auscultation, bronchial breath sounds, tactile fremitus, and egophony ("E" to "A" changes). The patient also may be tachypneic. A prospective study7 showed that patients with typical pneumonia were more likely than not to present with dyspnea and bronchial breath sounds on auscultation.(micek,s .t et al.,2005)

Radiography

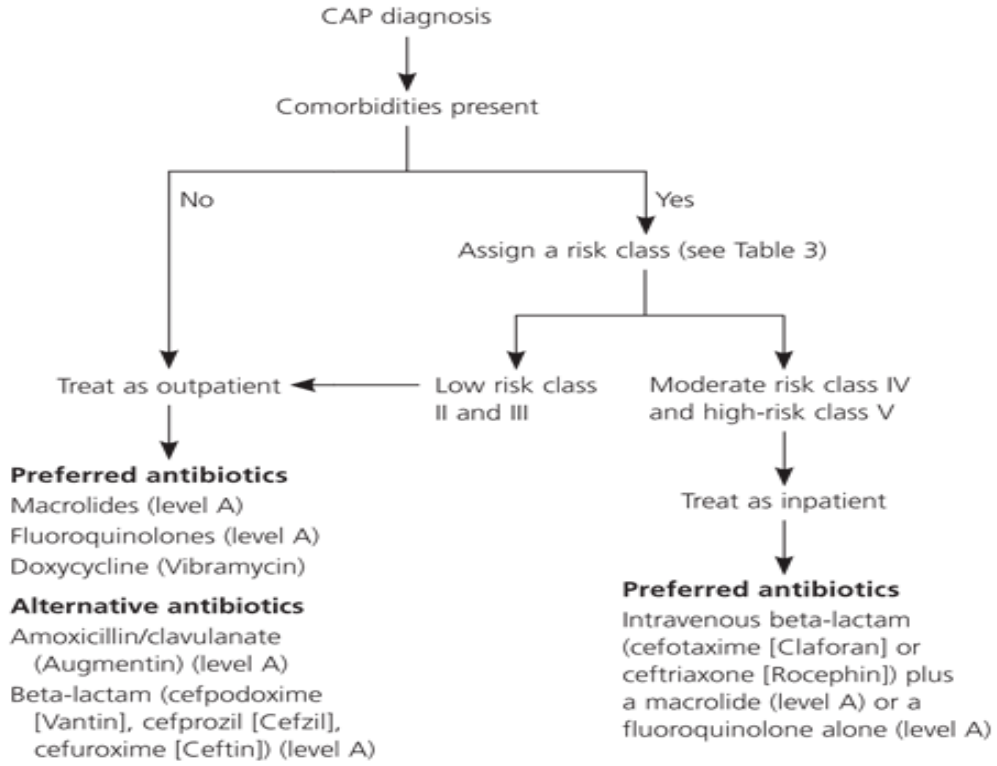
Chest radiography (posteroanterior and lateral views) has been shown to be a critical component in diagnosing pneumonia.8 According to the latest American Thoracic Society (ATS) guidelines for the diagnosis and treatment of adults with community acquired pneumonia, all patients with suspected community acquired pneumonia should have a chest radiograph to establish the diagnosis and identify complications (pleural effusion, multilobar disease).Chest radiography may reveal a lobar consolidation, which is common in typical pneumonia,or it could show bilateral, more diffuse infiltrates than those commonly seen in atypical pneumonia.

(micek,s .t et al.,2005) However, chest radiography performed early in the course of the disease could be negative.

Laboratory tests for community-acquired pneumonia

Historically, common laboratory tests for pneumonia have included leukocyte count, sputum Gram stain, two sets of blood cultures, and urine antigens. Laboratory test will given a clear data of current situation and infection condition of body. However, the validity of these tests has recently been questioned after low positive culture rates were found (e.g., culture isolates ofS. Pneumonia were present in only 40 to 50 percent of cases) Such low positive culture rates are likely due to problems with retrieving samples from the lower respiratory tract, previous administration of antibiotics, contamination from the upper airways, faulty separation of sputum from saliva when streaking slides or plates, or viral etiology. (Roubinian t,et al.,2006) Furthermore, sputum samples are adequate in only 52.3 percent of patients with CAP, and only 44 percent of those assumptions that the presenting disease is caused by acommon bacterialpathogens

TREATMENT ALGORITHM FOR COMMUNITY ACQUIRED PNEUMONIA



This is the treatment algorithm for community acquired pneumonia and its shows that after pneumonia treatment any co morbidities shows then this classified to risk class, in this also divided in to two .One is low risk class and moderate and high risk class In this group of patients referred to inpatient and they need intravenous antibiotic treatment like beta fluroquinolones, ,macrolides or lactumase . (Williams c at el.,2006)The patients shows low risk class or not shows any co morbidities then the treat as out patients and prescribed oral antibiotics like macrolides,fluroqunolones, tetracycline's and penicillin's

Hospital acquired pneumonia

Hospital acquired pneumonia is defined as infectin wiil happend after 48 more after hospital admission and that was not present at the time of admission. Ventilator acquired pneumonia is refers to pneumonia that occurs 48 hours or more

after endotracheal intubation. Health care associated pneumonia includes patients who have recently has been hosptlize long timess of the infection, resided in a nursing home or long-term care facil, or received parenteral antimicrobial therapy, chemotherapy, or wound care within 30 days of pneumonia(abele-horn, et al.,1997)

Pathogenesis

Pneumonia occurs when the host's ability to fight against invading microbial pathogens is found in human body.of the immune system could be due to interplay amongst different host factors, a depressed level of consciousness leading to impaired mechanical (ciliated epithelium and mucus), humoral, and cellular host including underlying comorbidities,

inhalation of aerosols containing bacteria, or, less frequently, hematogenous spread from a distant immunosuppressive medications, and defenses. Bacteria may enter the lower respiratory tract by micro- or bolus-aspiration For the study I have collected 462 bronchopneumonia prescription, and dates from two hospitals.After collecting prescription to check the prescription according to standard guideline. From the prescription I separated patents demographics data such as gander wise distribution, alcoholic distribution, smoking wise distribution ,age wise distribution ,hospital wise distribution and anti microbial prescription wise distribution data's. From the prescription I collected patients medical cost, and separately oral cost injections rate, evoheller cost and total medical cost. Also collected non medical cost such as laboratory tests cost ,nursing cost ,travelling

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of oropharyngeal organisms, inhalation of aerosols containing bacteria, or, less frequently, hematogenous spread from a distant body site.micro aspiration is believed to be the most important because of both community-acquired and Hospital acquired pneumonia. Studies have shown that up to 50% of healthy subjects aspirate during sleep. Those with abnormal swallowing will be at a higher risk of aspiration. Hospitalized patients, particularly those who are mechanically ventilated and in a decreased level of consciousness due to either underlying disease or sedative drugs, are at the highest risk.(Abele-horn m, et al.,1997).The types of aspirated microbial pathogens will depend on the bacterial colonization of the oropharynx. Previous studies demonstrated that about 70% of patients who are hospitalized for at least 4 days will have their oropharynx colonized with gram-negative bacilli organisms, rendering GNB as the most common pathogen that causes HAP. Gram-negative bacteria account for fifty five percentge and 60 percetage of total infections of pneumonia%.

In mechanically hospitalized tients, incubation during the intubation process, leakage of colonized oropharyngeal secretions around the endotracheal tube cuff, or condensation of air particles from a contaminated ventilatory circuit. Whether stomach or sinuses serve as potential reservoirs for bacterial colonization of the

oropharynx is still being debated. Theendothelial ubeper respiratory tract host defenses allowing for pooling of oropharyngeal secretions above the endotracheal tube(cuff. In addition, it is believed there is a biofilm formation over the bacterial colonization of endotracheal tube , making de-colonization of the endotracheal tube (ET) difficult. (Daubar a,et al,.1997) .The development ofventilator asosciated pneumonia patientds mortality 2 to 10 times higher than those without hospital accured pnumonia patients

Causes

- S anchopneumonia mmon illness. It is caused by many different germs. Pneumonia that starts in the hospital tends to be more serious than other lung infections because:

- Pneumonia patinebt pital are often very sick and cannot fight off germs.

- The types oeither posituve or gegativeoften more dangerous than those outside in the community.

- Pneumonia occurs more often in patients who are using a breathing machine This machine helps them breathe.

- HAP is also infecte by health care profetionals and other hospital stafs they interact with pneumonia patirnts from one patient to another. This is why hand-washing, wearing gowns and using other safety measures is so important in the hospital.

- Patients is more contact with other patients nia while in the hospital:

- Patients who have drinking ha bit
- persons who underwent chest or cardiac surgeury jor surgery
- peoples they have less innmune systemcancer treatment, certain medicines, or severe wounds
- Patients have long-term (chronic) lung disease
- Breathe saliva or food into their lungs as a result of not being fully alert or having swallowing problems
- Patients suffering from chronic obstructive pulmonary diseases

Symptoms

- **Fever and chills**
  - In an elderly person, the first sign of hospital-acquired pneumonia may be mental changes or confusion
  - A cough with greenish or pus-like phlegm (sputum)
  - General discomfort, uneasiness, or ill feeling (malaise)
  - Loss of appetite
  - Nausea and vomiting
  - Sharp chest pain that gets worse with deep breathing or coughing
  - Shortness of breath

- Decreased blood pressure and high heart rate

Laboratory test for hospital acquired pneumonia

Tests to check for HAP included

- ABGo measure oxygen levels in the blood
- Blood was culterd by hospital laboratory
- Ct scan and chest x ray from thatthe lungs
- Blood tyest it meen s compleate blood test
- Test done by pule oximetry
- Sputum culture or sputum gram stain, to check for what germs are causing the pneumonia.

Health care associated pneumonia

Patients also may get bronchopneumonia from other health care profetionals it may leads to health care associate pneumonia. of pneumonia is called health care-associated pneumonia.(Alvarez-lerma f,et al.,1996)

OTHER COMMON TYPES OF PNEUMONIA

Types of pneumonia grouped by causes

Type of pneumonia based on the causing microorganism, they are divided in to three they are bacterial pneumonia, viral pneumonia, and mycoplasma pneumonia

Bacterial pneumonia

Bacterial pneumonia can affect anyone at any age. It can develop on its own or after a serious cold or flu. The most common cause of bacterial pneumonia is streptococcus pneumoniae. Bacterial pneumonia can also be caused by Chlamydophila pneumoniaor legionella pneumophila. Pneumocystis jiroveci pneumonia is sometimes seen in those who have weak immune systems, due to illnesses like AIDS or cancer. (Ambrose p. et al.,)

Viral pneumonia

In most cases, respiratory viruses can cause pneumonia, especially in young children and the elderly. Pneumonia is usually not serious and lasts a short time. However, the flu virus can cause viral pneumonia to be severe or fatal. It's especially harmful to pregnant women or individuals with heart or lung issues. Invading bacteria can cause complications with viral pneumonia.

Mycoplasma pneumonia

Mycoplasmas are not viruses or bacteria, but they have traits common to both. They are the smallest agents of disease that affect humans. Mycoplasmas generally cause mild cases of pneumonia, most often in older children and young adults.

IDENTIFICATION TESTS FOR BRONCHO PNEUMONIA

Pneumonia can be hard to diagnose because it may seem like a cold or the flu. We may not realize it's more serious until it lasts longer than these other

conditions.Pneumonia was diagnosed based on patient's medical history, a physical exam, and test results.

MEDICAL HISTORY

Patient's signs and symptoms find out by physician and how and when they began. To find out what type of germ is causing the pneumonia, he or she also may ask about:

- Any recent traveling done by patient
- Patients hobbies
- Patients exposure to animals
- Patients exposure to sick people at home, school, or work
- Past and current medical conditions, and whether any have gotten worse recently
- Any medicinestaken by patient
- Smoking habit of patients

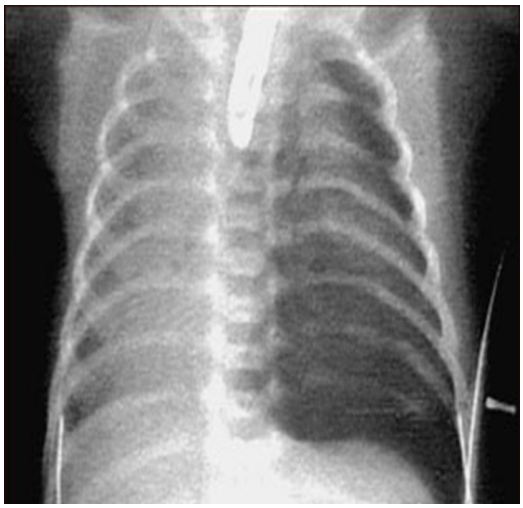
PHYSICAL EXAMINATION TEST FOR PNEUNONIA

Patientslungs are listen physician with the help ofstethoscope. If personson is suffering from pneumonia , and rumbling sounds when patient inhale. Doctor also may hear wheezing. Physician may find it hard to hear sounds of breathing in some areas of your chest. (Alvarez-lerma f,et al.,1996)

DIAGNOSTIC TESTS FOR BRONCHOPNEUMONIA

Chest x ray test for pneumonia

the best test for diagnosing pneumoniawon't tell doctor what kind of germ is causing the pneumonia..Chest x ray should give a feed back about patient chest and presents of pneumina infection in the chest area lungs, and blood vessels. A chest x ray is. However, this test



(Courtesy: Adams)

Blood tests for pneumonia

Cbe test will give the information of pathogenisis in patients body present in the body . including the number of white blood cells in the blood sample .measures many parts of blood,This test is used to detect germs in the bloodstream. The number of white blood cells can show whether have a bacterial infection.

Blood culture test is get information has spread to patient bloodstream.. A blood culture is.show which germ caused the infection. physiciant can decide how to treat the infection.

Sputum test for pneumonia

this collected from patient after a deep sputum it maybbe help to doctor what germ is causing pneumonia. Then, he or she can plan treatment.

Chest computed tomograph for bronchopneumonia

X ray test is the the one of the easy method to find out pneumoniathe structures in patient chest, such as lungs.Its show more detail than those of a standard chest x ray. A chest CT scan is a type of x ray,

leural fluid culture fro pneumonia test

this test, a fluid sample is taken from the pleural space its taken between chest and spinal cavity of human body physicains use a procedure called thoracentesis to collect the fluid sample. The fluid is studied for germs that may cause pneumonia.

Pulse oximetry test for pneumonia

If patient very sick, doctor may need to measure the level of oxygen in blood using a blood sample. The sample is taken from an artery, usually wrist. This test is called an arterial blood gas test.. Pneumonia can keep patient lungs from moving enough oxygen into bloodstream.

For this test, a small sensor is attached to patient finger or ear. The sensor uses light to estimate how much oxygen is in blood

Bronchoscopeis a procedure used to look inside the lungs' airways. If patient is in the hospital and treatment with antibiotics isn't working well, doctor may use this procedure (Garvey m j,et al.,2002)

Physican findthin, flexible tube through patients' nose or mouth, down throat, and into the airways. The tube has a light and small camera that allow doctor to see windpipe and airways and take pictures.This are common test for bronchopneumonia

TRANSMISSION OF PNEMONIA TO PATIENTS TO PATIENTS

The infectiosof pneumonia is spredin the mouth and nose of the infected person. They can be spread easily to another personthey enter the person's body through their mouth, nose, or eyes. When this happens, either through the air or by touching a contaminated surface. Typically, , a battle begins -- the person's immune system tries to kill the germs, while the germs try to multiply.

. This is because many of the viruses and bacteria that cause people to get pneumonia are the same ones that cause upper respiratory infections. Although a person with either viral or bacterial pneumonia is contagious, that person's germs are more likely to cause an upper respiratory infection in another person such as the common cold andsneezing than pneumonia

TREATEMENT OF BRONCHOPNEUMONIA

General treatment for pneumonia

If the patient has pneumonia, follow by treatment plan, take all medicines as prescribed, and get ongoing medical care. Ask to doctor when patient should

schedule follow up care. Doctor may want to have a chest x ray to make sure the pneumonia is gone.

Although patient may start feeling better after a few days or weeks, fatigue (tiredness) can persist for up to a month or more. People who are treated in the hospital may need at least 3 weeks before they can go back to their normal routines

Erliar stage pneumonia can be treated noneedthospitalization. Typically, bronchodiolator ,antibiotics , and home care are sufficient for complete resolution. Howeve r patient with other medical problems, patients pneumonia who are having trouble breathing,, and the elderly may need more advanced treatment. , the pneumonia does not improve with home treatment If the symptoms get worse, or complications occur, the patientwill often have to be hospitalized. (Garvey m j, et al.,2002)

Bacterial pneumonia

. Treatment for pneumonia should ideally be based on the causative microorganism and its known antibiotic sensitivity. The antibiotic choice depends on the nature of the pneumonia, the most common microorganisms causing pneumonia in the local geographic area, and the immune status and underlying health of the individualAntibiotics are used to treat bacterial pneumonia. In contrast,Because treatment should generally not be delayed in any person with a serious pneumonia, empiric treatment is usually started well before laboratory reports are available antibiotics are not useful for viral pneumonia, although they sometimes are used to treat or prevent bacterial infections that can occur in lungs damaged by a viral pneumonia.. However, a specific cause for pneumonia is identified in only 50% of

people, even after extensive evaluation..(Antonelli,m.et al.,1998) In the india , clarithromycin amoxicillin and or erythromycin are the antibiotics selected for most patients with community-acquired pneumonia; patients allergic to penicillin's are given erythromycin instead of amoxicillin.doxycycline have displaced amoxicillin as first-line outpatient treatment for community-acquired pneumonia India andAmerica, where the "atypical" forms of CAP becoming more common, macrolides (such as azithromycin and clarithromycin), the fluoroquinolones, and. The duration of treatment has traditionally been seven to ten days, but there is increasing evidence that shorter courses (as short as three days) are sufficient. (Azouay e, et al.,2006l)

Multiple antibiotics may be administered in combination in an attempt to treat all of the possible causative microorganisms Antibiotics for HCP first second -generation cephalosporins, carbapenems, fluoroquinolones, amino glycosides, and vancomycin.Extremely sick individuals may require intensive care, often including endotracheal intubation and artificial ventilation. . These antibiotics are usually given intravenously People who have difficulty breathing due to pneumonia may require extra oxygen.. Antibiotic choices vary from hospital to hospital because of regional differences in the most likely microorganisms, and because of differences in the microorganisms' abilities to resist various antibiotic treatments.

Viral pneumonia

Viral pneumonia caused by influenza A may be treated with rimantadine or amantadine, while viral pneumonia caused by influenza A or B may be treated with oseltamivir orzanamivir. These treatments are beneficial only if they are started

within 48 hours of the onset of symptoms. Many strains of H5N1 influenza A, also known as avian influenza or "bird flu," have shown resistance to rimantadine and amantadine. There are no known effective treatments for viral pneumonias causedadenovirus, Hantavirus, or parainfluenza virus by the SARS coronavirus,. . (Azouay e, et al.,2006|)

Aspiration pneumonia type

A combination of a beta-lactam antibiotic and metronidazole, or an aminoglycoside.There is no evidence to support the use of antibiotics in chemical pneumonitis without bacterial infection. If infection is present in aspiration pneumonia, the choice of antibiotic will depend on several factors, including the suspected causative organism and whether pneumonia was acquired in the community or developed in a hospital setting.In cases where the pneumonia progresses to blood poisoning (bacteremia), just over 20% of sufferers die Common options include clindamycin, Corticosteroids are commonly used in aspiration pneumonia, but there is no evidence to support their use either. Viral pneumonia may last longer, and mycoplasma pneumonia may take four to six weeks to resolve completely. .(Azouay e, et al.,2006|).

limited access to x-rays, limited antibiotic choices, and inability to treat underlying conditions inevitably leads to higher rates of death from pneumonia. For these reasons,The mortality rate pneumonia depends on the underlying cause of the pneumonia.Pneumonia caused by "Mycoplasma","Staphylococcus aureus" for instance, is associated with little mortality. However, about half of the people who develop methicillin-resistant pneumonia while on a ventilator will die. In regions of

the world without advanced health care systems, pneumonia is even deadlier. Limited access to clinics and hospitals, the majority of deaths in children under five due to pneumococcal disease occur in developing countries. (Baker a m, et al.,2001)

COMMONLY USED ANTIBIOTICS FOR BRONCHOPNEUMONIA

Macrolides

Generic Name	Brand Name
Azithromycin	Zithromax, Zmax
Clarithromycin	Biaxin
Erythromycin	Eryc, EryPed, Ery-Tab
Roxithromycin	Biorox,Biolide

The macrolides bind irreversibly to a site on the 50S subunit of the bacterial ribosome, thus inhibiting the translocation steps of protein synthesis. They may also interfere at other steps, such as transpeptidation. Generally considered to be bacteriostatic, they may be bactericidal at higher doses. Their binding site is either identical or in close proximity to that for clindamycin and chloramphenicol.(Bell r, et al.,1997)

Tetracyclines

Generic Name	Brand Name
doxycycline	Doryx, Vibramycin

a discussion of the mode of action of tetracyclines requires consideration of uptake and ribosomal binding mechanisms It is well established that tetracycline's inhibit bacterial protein synthesis by preventing the associationTherefore, to interact with their targets these molecules need to traverse one or more membrane systems

depending on whether the susceptible organism is gram positive or gram negativ of aminoacyl-tRNA with the bacterial ribosome. e. Hence,. Also pertinent to this of the joint antibacterial-antiprotozoal activity of the tetracyclines and the microbial selectivity of the class as a whole.

(Bergmans d c,et al.,1997) Most of these issues have been considered at length in recent years, so the focus here will be on new information.

Fluoroquinolones

commonly DNA gyrase is more sensitive in gram-negative bacteria and topoisomerase IV more sensitive in gram-positive bacteria The formation of the ternary complex of quinolone, DNA, and either DNA gyrase or topoisomerase IV occurs through interactions in which quinolone binding appears to induce changes in both DNA and the topoisomerase that occur separately from the DNA cleavage that is the hallmark of quinolone. In a given bacterium these 2 enzymes often differ in their relative sensitivities to many quinolones, and. Usually the more sensitive enzyme represents the primary drug target determined by genetic tests, but poorly understood exceptions have been documented.actionThe mode of action of fluroquinolones involves interactions with both DNA gyrase, the originally recognised drug target, and topoisomerase IV, a related type II topoisomerase (Bergmans d c,et al.,1997)

Generic Name	Brand Name
Gemifloxacin	Factive 320
Levofloxacin	Levaquin
Moxifloxacin	Avelox 500
Cprofloxacin	Ciproxent

CEPHALOSPORINS

Cephalosporin's are grouped into "generations" based on their spectrum of antimicrobial activity. Newer generation has significantly greater gram-negative antimicrobial properties. Cephalosporin's are classified in to four group. they are first generation drugs areCefadroxi,Cephalexin,Cephaloridine,Cephalothin, Cephapirin,Cefazolinand Cephradine

Second generation cephalosporin's have more antibacterial activity and More resistant to beta-lactamase ,the drugs are Cefaclor.Cefoxitin.Cefprozil.Cefuroxime

Third generation cephalosporins have abroad spectrum of activity and increased activity against gram-negative organisms and excellent activity against most strains of Streptococcus pneumoniae.The drugs are Cefdinir,Cefixime,Cefpodoxime,Ceftibuten,Ceftriaxone And Cefotaxime

Fourth generation cephalosporin's a greater resistance to beta-lactamase than the third generation cephalosporin's. It cross blood brain barrier and are effective in meningitis, more active against pneumococcal.Activity against nosocomial pathogens such as Enterobacter and Acinetobacte.The drugs areCefepime,Cefluprenam,Cefozopran,Cefpiromeand and Cefquinome.

Generic Name	**Brand Name**
Cefaclor	Alclor,Alfaclor
Cefadroxil	Acer,Acidrox
Cefprozil	Refzilo.3 cef fc
Cefuroxime	Ceftin

Cephalexin	Keflex

Cephalosporin's are bactericidal agents and have the same mode of action as other beta-lactamase antibiotics (such as penicillin's). All bacterial cells have a cell wall that protects them. Cephalosporins disrupt the synthesis of the peptidoglycan layer of bacterial cell walls, which causes the walls to break down and eventually the bacteria die.

Peptidoglycan is a heteropolymeric component of the cell wall that provides rigid mechanical stability. The final transpeptidation step in the synthesis of the peptidoglycan is facilitated by transpeptidases known as penicillin binding proteins (PBPs). PBPs bind to the D-Ala-D-Ala at the end of muropeptides (peptidoglycan precursors) to crosslink the Peptidoglycan.(Gaillard j c, et al.,2001)

Cephalosporin's mimic the structure of the D-Alanine link and bind to the active site of PBPs, disrupting the cross-linking process. If the peptidoglycan fails to cross-link the cell wall will lose its strength which results in cell lyses.

Penicillin's

Generic Name	**Brand Name**
Amoxicillin	Mox. A mox
Amoxicillin with clavulanate	Augmentin,Amoxiclave
Ampicillin	Acipillin,Ampidil DS
Piperacillin	Antepar,Avizine

Ticarcillin with clavulanate	Timentin

β-Lactam antibiotics work by inhibiting the formation of peptidoglycan cross-links in the bacterial cell wall.In addition, the build-up of peptidoglycan precursors triggers the activation of bacterial cell wall hydrolases and autolysins, which further digest the bacteria's existing peptidoglycanGram-positive bacteria are called protoplasts when they lose their cell wall.

Penicillin shows a synergistic effect with aminoglycosides, since the inhibition of peptidoglycan synthesis allows aminoglycosides to penetrate the bacterial cell wall more easily, For the study I have collected 462 bronchopneumonia prescription, and dates from two hospitals.After collecting prescription to check the prescription according to standard guideline. From the prescription I separated patents demographics data such as gander wise distribution, alcoholic distribution, smoking wise distribution ,age wise distribution ,hospital wise distribution and anti microbial prescription wise distribution data's. From the prescription I collected patients medical cost, and separately oral cost injections rate, evoheller cost and total medical cost. Also collected non medical cost such as laboratory tests cost ,nursing cost ,travelling cost ,in case of inpatient I collected hospital room cost also then prepared non medical cost of each and every patients and recorded it .I collected total medical cost of bronchopneumonia from additions of both medical and non medical cost. Bronchopneumonia is one the infectious disease and I find number of days of medical treatement, and average of prescription per day. Finally differentiate type of antibiotics prescribed for the patient's ant its total.

the bacteria's existing peptidoglycan. (Gaillard j c, et al.,2001). allowing its disruption of bacterial protein synthesis within the cell. This results in a lowered for susceptible organisms

DEMOGRAPHIC DATA OF BRONCHOPNEUMONIA

. Pneumonia affects children and families everywhere, but is most prevalent in asia and africa and europe Pneumonia is the single largest cause of death in children worldwide Pneumonia is a form of infection that affects the lungs.which fill with air when a healthy person breathes. When an individual has pneumonia The lungs are made up of small sacs called alveoli, , the alveoli are filled with pus and fluid, which makes breathing painful and limits oxygen intake.

All theyear pneumonia kills 1.1 million children under the age of five years, Children can be protected from pneumonia, it can be prevented with simple interventions, and treated with low-cost, low-tech medication and care accounting for 20% of all deaths of children under sixe years old worldwide. (Faraser, et at.,2001)

PNEUMONIA IN INDIA

After evidence that India is lagging behind on the Millennium Development Goal (MDG) of reducing Infant Mortality Rate by 2015, it now turns out that it is faltering on the child survival MDG as well.(Gupta D, et al.,2012)

The first-ever report tracking global progress against pneumonia, the leading killer of children under five years of age, finds that India is witnessing the highest number of pneumonia-related child deaths in the world. The infection is killing 16 lakh children under five every year, more than 3.7 lakh in India alone.

Commenting on pneumonia deaths among young children in India, president of the academy informed that the disease globally killed an estimated 1.4 million children below the age of five years every year-more thanAIDS, malaria and tuberculosis together did. It is alarming that India accounts for almost 25 per cent of the world's pneumonia deaths of children. Pneumonia accounts for 20 per cent deaths among children below 5 years of age becoming the leading cause of death in the age group. According to the IAP records, annually, India witnesses 45 million pneumonia cases among children below 5 years of which 0.37 million die due to pneumonia,(shah b a, et al.,2010)

PAHRMACIST INVOLVEMENT IN CARE FOR BRONCHOPNEUMONIA

Bronchopneumonia is the most frequently occurring infectious disease in the world, and it is also the sixth most common cause of death. Pneumonia occurs most frequently in the winter and in elderly patients. Treatment and prevention strategies for Pneumonia include antimicrobial therapy targeting the most frequently occurring causative microorganism, as well as smoking cessation and appropriate immunizations.The pharmacist, as a part of the health care team, can assist in improving outcomes by optimizing the treatment in patients diagnosed with acute bronchitis,and pneumonia

ANTIBIOTIC TREATEMENT

Recommendations for cough products should be based upon patient description of the cough as either productive or nonproductive Pharmacists may play an importement role to reduse the pneumonia spreding all over the world.pneumonia

,Patients either seen in the emergency room or admitted to the hospital require counseling for appropriate use of nebulizer or prior to discharge to ensure optimal therapy. (Maisha Kelly Freeman, et al., 2013)as well as selection of supportive therapies for cough pharmacist shoul council the patient regarding its spreding mode and precoutionse selection and dosing of antibiotic therapy may be guided by the pharmacist,.. Pharmacists can counsel on appropriate use, adverse effects, and anticipated outcomes with pharmacotherapy. Also, for those patients who are admitted to the hospital, the pharmacist is able to recommend transition from intravenous to oral therapies.In the community setting, pharmacists play a significant role in recommending therapy for cough and no pharmacologic therapies in patients with pneumonia. in nature.(Bhaskar ,E et al.,2010)

SMOKING CESSATION PROGRAMS CONDUCTED BY PHARMACIST

Pharmacist play an important role to give information about bronchopneumonia, Pharmacist should given the information about wt are the side effects of pneumonia. Pharmacists and practitioners should assess the smoking status of an individual as well as their interest in cessation. Further and wt is the relation between smoking and pneumonia etc, in case of smokers pneumonia is essly spreded becouse of pneumonia affect the lungs alvioli and in case of smokings it also affect in the lungs so pharmacist must given an information about pneumonia ner for information about smoking cessation products since the majority of these are OTC products, attempts should be made to determine the type of tobacco product being consumed, as well as how much and how often. If a patient is initially unwilling to stop smoking, each subsequent visit should assess readiness to quit as well as further education on the benefits of smoking cessation, In case tobaco s of complete and

long-term abstinence from using any tobacco product. Other important factors to discuss with patients, who may or may not be actively using tobacco products, are the health consequences associated with second-hand and third-hand smoke. In a clinical setting, patients are able to express how troublesome second-hand smoke is for their respiratory illness; however, many times a connection with exacerbations from residual smoke on clothing, furniture, and bedding is not made.(Maisha Kelly Freeman, et al.,2013)

PRESCRIPTION TREND

This observational study is "to evaluate antimicrobial prescription trend and direct cost analysis of various drug prescribed for bronchopneumonia", the study concludes that patients age wise demographic data shows that 31.2% patients are in the age group of 31-40 out of 462 patient 144 patients are the above age group .Gender wise demographic data shows that 292 pneumonia patients are male and a170 patients are females in my study. Smoking habit distribution data shows that 204 patients are smoker its comes around 44.2% total study population .smokers are easily affect pneumonia according to standard guidelines .Anti microbial prescription data shows that 100% patients are got antimicrobial prescription because pneumonia totally recovered from the patient body by the use of antimicrobial administration . For the theses work I collected details from two hospitals, it shows 267 patients from shanker hospital and 195 patients from ramdas hospital

Cost range of antimicrobial prescription is different in each every patient in my study shows that 36.9 patients have more than 1000 rupees for antibiotics ,and

all this patients are inpatients and 37.1% of patients have anti biotic cost range from 2001-400 all this patients are out patients and its 172 patients

Pharmacoeconomics

This observational study is "to evaluate antimicrobial prescription trend and direct cost analysis of various drug prescribed for bronchopneumonia", the study concludes that patients age wise demographic data shows that 31.2% patients are in the age group of 31-40 out of 462 patient 144 patients are the above age group .Gender wise demographic data shows that 292 pneumonia patients are male and a170 patients are females in my study. Smoking habit distribution data shows that 204 patients are smoker its comes around 44.2% total study population .smokers are easily affect pneumonia according to standard guidelines .Anti microbial prescription data shows that 100% patients are got antimicrobial prescription because pneumonia totally recovered from the patient body by the use of antimicrobial administration . For the theses work I collected details from two hospitals, it shows 267 patients from shanker hospital and 195 patients from ramdas hospital

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Orals route of drugs such as antibiotics and other oral drugs are such as tablets and syrups cost range vary from patient to patients in my study shows that 294 patients are in the range of 401-600 cost range its 63.6% of total study population .

In my study cost range of injections only for out patients not for in patients because in my study only inpatients are taken injections .it shows that 85 patients are taken injections in the range of 2001-3000 ,and 25 patients taken in the cost range of 3001-4000.

Cost range of evoheller is taken in this study it shows that 221 patients are taken evoheller it include both inpatients and out patients from this 103 patients are taken the evoheller in the range of 201-300 and it is 22.3 %of total study population

In this study I collect total medical cost range of each and every patient in my study ,out of 462 patients 170 patients have more than 1201 cost range ,and all those patients are out patients .in case of out patients ,116 patients medical cost is in average 601-800 its around 25.1% of total patients.

In this theses' work I collected non medical cost of the patient it shows that 201-400 cost range of patients are 131, 401-600 range patients are 160 its around 34.6%and 1001 or more range are 170 it s around 36.7% over all patients all the 170 patients are in patients.

For understanding total cost of prescription I combined with total medical cost and non medical cost, it shows that 47% of patients are come in the range of 1001-2000, all this patients are out patients and in case of in patients 56% of patients

are the cost range of 10001 and above. All the inpatients range is started from 4001-10001 and above,but in case of in patient range is 1-1000 to 3000.

For this study I collected number of days of prescriptions details of all the patients. The number of days will vary from severity of patients. It shows that 418 patents are in the range of 10-12 days of prescription, it means 90.5% of my study populations patients are in the range of 10-12 days range.

Average cost of each prescription was find out in the study it shows that 167 patients have the range 100-199 and 125 patients have the range from 0-99,its comes around the percentage 36.2 and 27.1 respectively and all the above mentioned is out patients details only. In case of in patients ranges from 400-499 to 1000 and above,in this 38 patients are range from 900-999.

Finally I collected different type of antibiotics used for pneumonia, antibiotics are prescribed according to patients diseases condition. From my study 16 different antibiotics are prescribed .and my study shows that Azithromycin was more prescribed that is 204 antibiotic prescriptions .and then the combination of amoxicillin with pottasium clavulanate is around 92 prescriptions. The study shows that out of 462 pneumonia patients 744 antibiotics are prescribed, that is both in the form of orals and injections.

I conclude the study, Antibacterial prescription trend in bronchopneumonia, cost of antimicrobial prescription in bronchopneumonia and total treatment cost of bronchopneumonia was understood and Medical cost involved in treating bronchopneumonia and non medical cost involved in treating bronchopneumonia was studied.

Economies is about trade-offs and choices between wants, needs, and the scarcity of resources to fulfill these wants. When considering economies, most people think of the trade-offs between goods and services and money; however the trade-off might also be expressed in humanistic terms. We are therefore, careful to include both resource use and humanistic evaluations of drug therapy within Pharmacoeconomics assessment.

used in the model come from

LITERATURE REVIEW

Jarab A.S et. al.,(2011) has evaluate the impact of pharmaceutical care intervention, with a strong focus on self- management, on a range of clinical and humanistic outcomes in patients with Bronchopneumonia. Total of 133 pneumonia patients were randomly assigned to intervention or control group. A structured education about pneumonia and COPD and management of its symptoms was delivered by the clinical pharmacist for patients in the intervention group. Patients were followed up a scheduled visit. Effectiveness of the intervention was assessed in terms of improvement in health-related quality of life medication adherence, disease knowledge and healthcare utilization. Data collected at baseline and at assessment was coded and entered into SPSS total of 66 patients were randomized to the intervention group and 67 patients were randomized to the control group. Although the current study failed to illustrate significant improvement in health-related quality of life parameters, the results indicated significant improvements in pneumonia knowledge the enhanced patient outcomes as a result of the pharmaceutical care programmers in the present study demonstrate the value of an enhanced clinical pharmacy service in achieving the desired health outcomes for patients with pneumonia and COPD

Samiar S.Shah,et al.,1994-2007 conducted a study about Ambulatory Visit Rates and Antibiotic Prescribing for Children with Pneumonia, Department of Pediatrics, University of California, San Francisco, California declined after the widespread use of the heptavalent pneumococcal conjugate vaccine. The national incidence of outpatient visits for CAP, however, is not well established. Although no

pediatric CAP treatment guidelines are available, current data support narrow-spectrum antibiotics as the first-line treatment for most patients with

Moller AH,et al.,in the year of 2012 conducted a study on cost-effectiveness analysis of reducing ventilator-associated pneumonia at a Danish ICU with ventilator bundle More than 100,000 patients each year in Denmark experience nosocomial infections, erroneous medication, or pressure ulcers while hospitalized. The Danish Safer Hospital Program includes 12 bundles for improving patient safety through the introduction and maintenance of evidence-based routine treatment or standard procedures. For the study I have collected 462 bronchopneumonia prescription, and dates from two hospitals.After collecting prescription to check the prescription according to standard guideline. From the prescription I separated patents demographics data such as gander wise distribution, alcoholic distribution, smoking wise distribution ,age wise distribution ,hospital wise distribution and anti microbial prescription wise distribution data's. From the prescription I collected patients medical cost, and separately oral cost injections rate, evoheller cost and total medical cost. Also collected non medical cost such as laboratory tests cost ,nursing cost ,travelling cost ,in case of inpatient I collected hospital room cost also then prepared non medical cost of each and every patients and recorded it .I collected total medical cost of bronchopneumonia from additions of both medical and non medical cost. Bronchopneumonia is one the infectious disease and I find number of days of medical treatement, and average of prescription per day. Finally differentiate type of antibiotics prescribed for the patient's ant its total.

The cost per VAP episode prevented was 311570rupees, and cost per death prevented was 2225440rupees. The incremental cost-effectiveness scatter plot showed that VB was more effective in 99.9%, and 42.6% have lower cost and better outcome for prevention of VAP. The incremental cost-effectiveness scatter plot showed that VB was more effective in 85.9%, and 31.6% have lower cost and better outcome for death prevented

Monique Martin,et al.,2008was conducted a study on cost-effectiveness analysis of antimicrobial treatment of community-acquired pneumonia taking into account resistance in Belgium . Research Centre for Pharmaceutical Care and Pharmaco-economics, Katholieke Universities Leuven, Belgium This article assesses the cost-effectiveness of outpatient antimicrobial treatment of community-acquired pneumonia (CAP) taking into account resistance in Belgium. there decision analytic model focused on mild to moderate CAP, but did not consider severe CAP. Treatment pathways reflected empirical treatment initiated in the absence of data on CAP etiology. First-line treatment consisted of moxifloxacin, co-amoxiclav, Cefuroxime or clarithromycin. If first-line treatment was unsuccessful, patients were either hospitalized or second-line treatment with a different antimicrobial was initiated. Clinical failure rates were obtained from the published literature or expert opinion. Costs were calculated using published sources from the third-party payer perspective. Effectiveness measures included first-line clinical failure avoided, second-line treatment avoided, hospitalization avoided and death avoided. Healthcare costs were included, but costs of productivity loss were not considered. Costs of treating a CAP episode amounted to 10080 with moxifloxacin/co-amoxiclav; 15540 with co-amoxiclav/clarithromycin; 14770 with Cefuroxime

/moxifloxacin; and 13510 with clarithromycin/moxifloxacin. The rate of first-line failure was 5%, 16%, 19% and 18% for these four treatment strategies, respectively. The rate of second-line treatment amounted to 4%, 13%, 16% and 15%, respectively. The hospitalization rate was 1%, 4%, 4% and 4%, respectively. The death rate was 0.01%, 0.04%, 0.03% and 0.03%, respectively. Sensitivity analyses supported the dominance of co-amoxiclav/ moxifloxacin in nearly all scenarios

De Pas cale G, et al.,In the year of 2006 Carried out a study on Steroids in severe pneumonia. He Despite more than sixty years of scientific medical research in USA about severe pneumonia, For the study I have collected 462 bronchopneumonia prescription, and dates from two hospitals.After collecting prescription to check the prescription according to standard guideline. From the prescription I separated patents demographics data such as gander wise distribution, alcoholic distribution, smoking wise distribution ,age wise distribution ,hospital wise distribution and anti microbial prescription wise distribution data's. From the prescription I collected patients medical cost, and separately oral cost injections rate, evoheller cost and total medical cost. Also collected non medical cost such as laboratory tests cost ,nursing cost ,travelling cost ,in case of inpatient I collected hospital room cost also then prepared non medical cost of each and every patients and recorded it .I collected total medical cost of bronchopneumonia from additions of both medical and non medical cost. Bronchopneumonia is one the infectious disease and I find number of days of medical treatement, and average of prescription per day. Finally differentiate type of antibiotics prescribed for the patient's ant its total.

either community-acquired or bronchopneumonia, remains a leading cause of death regardless of the patients' immunity state. The clinical introduction of new and more potent antibiotic molecules and the continuous development of efficientrespiratory assistance devices may not be able to radically improve the clinical outcome of pneumonia. Adjunctive therapies based on the physio pathological mechanisms of lung damage in severe pneumonia have been strongly advocated, and corticosteroids, which present many properties that theoretically interfere with these pathways, have been widely used, with conflicting results. The aim of this review is to examine existing literature data on steroid use in severe pneumonia

Michiel B.heeseker, et al.,in the year between of 2000to 2009 was conduct a study of Trends in Antibiotic Prescribing in Adults in Dutch General Practice .Antibiotic consumption is associated with adverse drug events (ADE) and increasing antibiotic resistance. Detailed information of antibiotic prescribing in different age categories is scarce, but necessary to develop strategies for prudent antibiotic use. The aim of this study was to determine the antibiotic prescriptions of different antibiotic classes in general practice in relation to age. Retrospective study of 22 rural and urban general practices from the Dutch Registration Network Family Practices (RNH). Antibiotic prescribing data were extracted from the RNH database from 2000–2009. Trends over time in antibiotic prescriptions were assessed with multivariate logistic regression including interaction terms with age. Registered ADEs as a result of antibiotic prescriptions were also analyzed.In total 658,940 patients years were analyzed. In 11.5% (n = 75,796) of the patient years at least one antibiotic was prescribed. Antibiotic prescriptions increased for all age categories during 2000–2009, but the increase in elderly patients (>80 years) was most

prominent. In 2000 9% of the patients >80 years was prescribed at least one antibiotic to 22% in 2009 (P<0.001). Elderly patients had more ADEs with antibiotics and co-medication was identified as the only independent determinant for ADEs.

Postma DF, van Werkhoven et.al., In the year of2010 Was study New trends in the prevention and management of community-acquired pneumonia .Community-acquired pneumonia (CAP) is an important cause of morbidity and mortality worldwide. This review summarizes current trends and knowledge gaps in CAP management and prevention. For the study I have collected 462 bronchopneumonia prescription, and dates from two hospitals.After collecting prescription to check the prescription according to standard guideline. From the prescription I separated patents demographics data such as gander wise distribution, alcoholic distribution, smoking wise distribution ,age wise distribution ,hospital wise distribution and anti microbial prescription wise distribution data's. From the prescription I collected patients medical cost, and separately oral cost injections rate, evoheller cost and total medical cost. Also collected non medical cost such as laboratory tests cost ,nursing cost ,travelling cost ,in case of inpatient I collected hospital room cost also then prepared non medical cost of each and every patients and recorded it .I collected total medical cost of bronchopneumonia from additions of both medical and non medical cost. Bronchopneumonia is one the infectious disease and I find number of days of medical treatement, and average of prescription per day. Finally differentiate type of antibiotics prescribed for the patient's ant its total.

Although Streptococcus pneumoniae is the most frequent cause of CAP, identification of the microbial cause of infection remains unsuccessful in most episodes and little is known about the aetiology of CAP in immunocompromised patients. Urinary antigen testing has become standard care for diagnosing Legionella infection, and pneumococcal urinary antigen testing is now recommended in the Dutch guidelines to streamline antibiotic therapy in patients hospitalized with CAP. In primary care C-reactive protein determination is recommended to improve antibiotic prescription for lower respiratory tract infections. In patients hospitalized with CAP, three strategies are considered equally effective for choosing empirical antibiotic treatment. Yet, more (and better designed) studies are needed to determine the best strategy, as well as to determine optimal (which usually means the minimum) duration of antibiotic therapy and the role of adjuvant treatment with corticosteroids. The effectiveness of the 23-valent pneumococcal polysaccharide vaccine in preventing invasive pneumococcal disease and pneumococcal CAP remains debated, and whether the newer conjugate vaccines are more effective remains to be determined. Many of these questions are currently being addressed in large-scaled trials in the Netherlands, and their results may allow evidence-based decisions in CAP management and prevention.

Mats Arne et. al., 2011was conducted a study on cost effective analysis of pneumonia and COPD To gain a more positive outlook on the disease,sample collected from the random population in Sweden in 2004 and 2008. The prevalence of subjects (40–84 years) who reported having pneumonia was 2.1% in 2004 and 2.7% in 2008. Data were analyzed for 1475 subjects. Regression models were used to analyze the associations between health measures most important factor

associated with good, self-rated health and quality of life was level of physical activity. Odds ratios for general health varied from 2.4 to 7.7 depending on degree of physical activity, where subjects with the highest physical activity level reported the best health and also highest quality of life

P.J. Wijkstra et. al., 1994 they had developed a rehabilitation programme at home and have investigated its effects on quality of life (QOL), lung function, and exercise tolerance in patients with Pneumonia and chronic obstructive pulmonary disease (COPD). We studied 43 patients with severe airflow obstruction: forced expiratory volume in one second (FEV1) 1.3±0.4 l FEV1/inspiratory vital capacity (IVC) 37±7.9%. After stratification, 28 patients were randomly allocated in a home rehabilitation program for 2 weeks. Fifteen patients in a control group received no rehabilitation. The rehabilitation group received physiotherapy by the local physiotherapist, and supervision by a nurse and a general practitioner.

Quality of life was assessed by the four dimensions of the Chronic Respiratory Questionnaire they found a highly in significant improvement in the rehabilitation group compared to the control group for the dimensions dyspnoea, emotion, and mastery. Lung function showed no changes in the rehabilitation group. The exercise tolerance improved significantly in the rehabilitation group compared to the control group. The improvement in quality of life was not correlated with the improvement in exercise tolerance. Rehabilitation of pneumonia and COPD patients at home may improve quality of life; this improvement is not correlated with an improvement in lung function and exercise tolerance.

AIM AND OBJECTIVE

AIM

To understand the cost of bronchopneumonia treatment at a tertiary care hospital in both IN and OUT patients

OBJECTIVES

- To understand the antibacterial prescription trend in bronchopneumonia
- Understand the cost of antibacterial prescription in bronchopneumonia
- Study the medical cost involved in treating bronchopneumonia
- Study the non medical cost involved in treating bronchopneumonia
- To understand the total treatment cost of bronchopneumonia

PLAN OF WORK

The present dissertation work was planned in 4 phases

PHASE 1

- Initial study to identify the scope of work
- Literature survey
- Preparation of study protocol

PHASE 2

- I E C clearance
- Designing of data entry format
- Gaining consent from hospital authority and patients
- Data collection

PHASE 3

- Identification of Pattern of drug use

PHASE 4

- Analysis of data

SOURCE OF DATA:

- From doctors prescription
- Hospital records
- Patient interviews

METHODOLOGY

This chapter discuss about study site, study population, study design, data collection and data analysis.

STUDY SITE

Study is carried out in two hospitals of malappuram and palakkad districts in kerala.Shankerhospital cherpulassery andRamdas clinic and nursing home perinthalmanna.Both hospitals having more than 100 beds specialized in most of various department like pediatrics,general medicine, ophthalmology, gynecology,etc.

STUDY DESIGN

A observational study to evaluate antimicrobial prescription trend and direct cost analysis of various drug prescribed for bronchopneumonia.

SAMPLE SIZE

462 prescriptions from pneumonia patients.

STUDY PREIOD

May 2013 to February 2014 (10 months)

STUDY CRITERIA:

INCLUSION CRITERIA

- Patients above the age of 10
- Patients below the age of 65
- Patients suffering from pneumonia

EXCLUTION CRITERIA

- Patients above the age of 65
- Mentally retarded patients
- Patients who have multiple illness
- Pregnant and lactating women's
- Non consultation patients
- An individual who use multiple care providers

STUDY PROCEDURE

For the study I have collected 462 bronchopneumonia prescription, and dates from two hospitals.After collecting prescription to check the prescription according to standard guideline. From the prescription I separated patents demographics data such as gander wise distribution, alcoholic distribution, smoking wise distribution ,age wise distribution ,hospital wise distribution and anti microbial prescription wise distribution data's. From the prescription I collected patients medical cost, and

separately oral cost injections rate, evoheller cost and total medical cost. Also collected non medical cost such as laboratory tests cost ,nursing cost ,travelling cost ,in case of inpatient I collected hospital room cost also then prepared non medical cost of each and every patients and recorded it .I collected total medical cost of bronchopneumonia from additions of both medical and non medical cost. Bronchopneumonia is one the infectious disease and I find number of days of medical treatement, and average of prescription per day. Finally differentiate type of antibiotics prescribed for the patient's ant its total.

RESULTS AND DISCUSSION

DEMOGRAPHICAL DATA

Bronchopneumonia is the one of the most spreading disease in the world. Pneumonia is a common illness affecting approximately 450 million people a year and occurring in all parts of the world. It is a major cause of death among all age groups resulting in 4 million deaths yearly

The area which I preferred for my thesis regarding my study bronchopneumonia two hospitals in malapuram and palakkad district in kerala.Ramdas hospital and poly clinic perintalmanna in malapuram district and Shankar hospital cherpulassery in palakkad district

Age wise distribution data

There is no significant relation between age and bronchopneumonia in my study .The age wise distribution data shows that highest number of patients consults with physician their age range between 31-40 yrs.

Table 1: Age wise distribution data

Age range(In yrs)	Male	Female	N=462	(%) to total
11-20	20	16	36	7.8%
21-30	31	21	52	11.2%
31-40	92	52	144	31.2%
41-50	65	44	112	24.2%
51-60	57	32	89	19.3%
61-70	27	5	29	6.2%

A total of about 462 patients were selected for this study. The table 1 shows the demographical data of the study conducted. It was noted that out of the 462 patients who part of the study different age group were. The chart clearly describes about the total number of people who attended the study from different age groups.

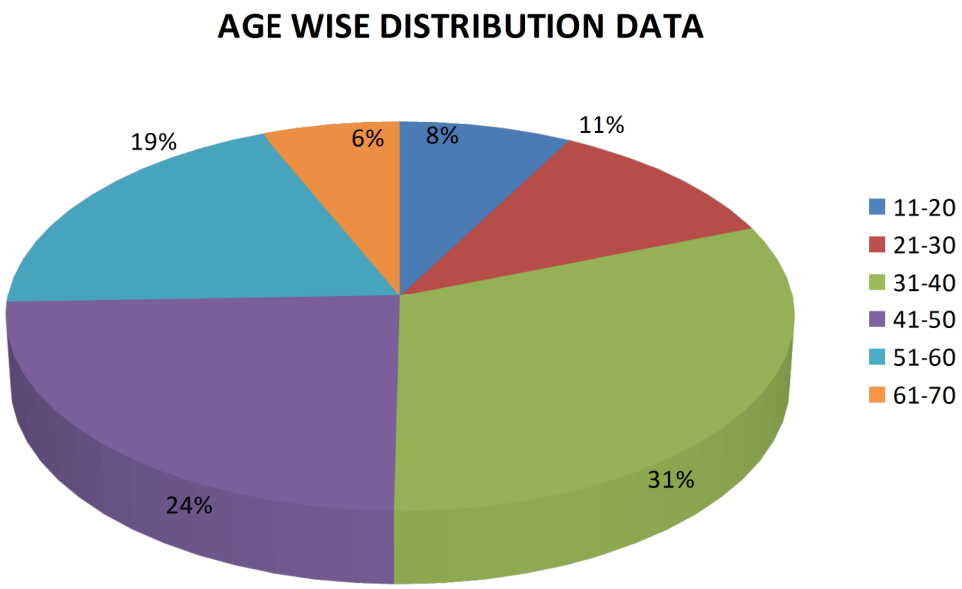

Figure 1: Age wise distribution data

From above graphical picture, we can easily find out the different age group of patients suffering from bronchopneumonia .The age limit chart says that about 11-20 age limit's around 7.8%, 21-30 age limit around 11,2%, 31-40 age limit around 31.2%, 41-50age limit around 24.2%, 51-60age limit around 19.3%, and age limit 61-70 around 6.2%.The chart says that the age limit between 31-40shows that more patients affected pneumonia in study .It around 31.2% total study population

Gender wise distribution data

There is no significant relation between gender and bronchopneumonia in my study,but in my study shows that male patients are more than female.

Table 2: Gender wise distribution data

Gender	N=462	Percentage to total
Male	292	63%
Female	170	37%

A total of about 462 patients completed this study. The table 2 shows the demographical data of the study conducted. It was noted that out of the 462 patients who were part of the study 292 were males and 170 were females. The chart clearly describes about the total number of people who attended the study from different age groups and the chart also gives a clear cut idea about the number of male and female patients who attended the program from different age groups and also says about the percentage of males and females from different age groups who suffers from pneumonia.

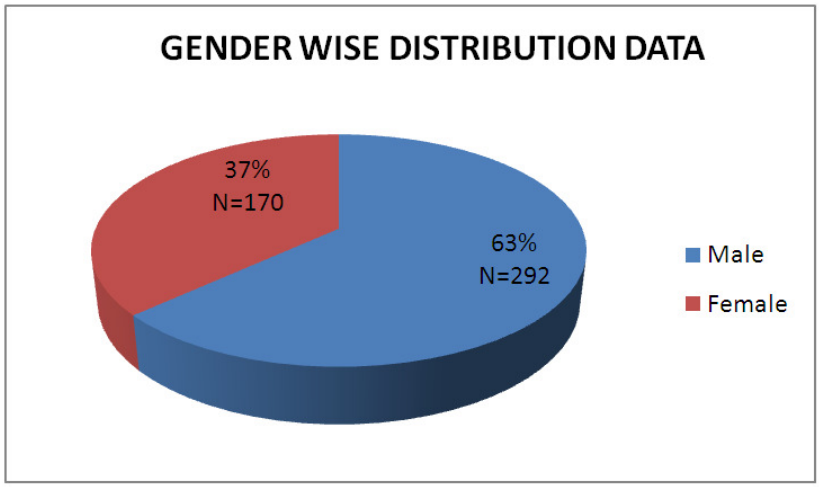

FIGURE 2: Gender wise distribution data

According to the graphical picture, male patients were more affected to bronchopneumonia than female patents. The chart says that about 63% of patients who attended the studies were males and about 37% were females.

Smoking habit data

Bronchopneumonia is a respiratory tract infectious disease mainly affected in lungs and respiratory tract .Now a days the smoker's population is increased all over India. So I collected number of patient are smoker in my study population

TABLE 3: Smoking habit data

Smoking habit	N=462	Percentage to total
Smokers	204	44.2%
Non smokers	258	55.8%

In my theses I have to collect smoking habit of patient's .The table shows that 204 patients are smokers and 258 patients are non smokers among the 462 patients.

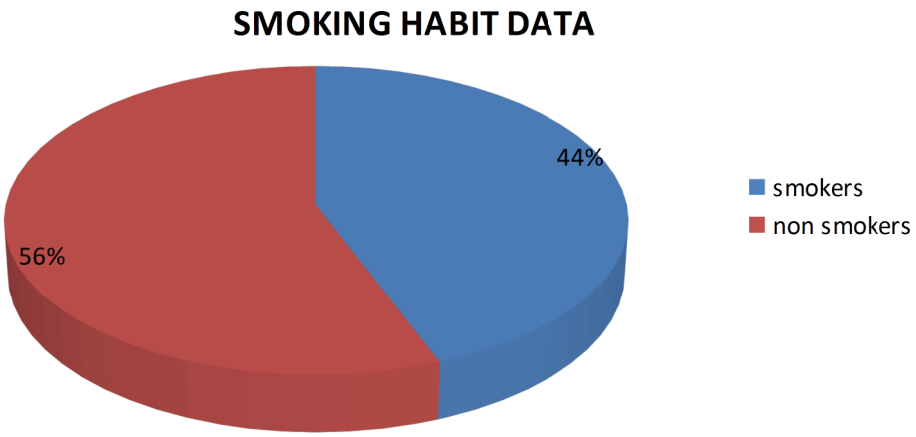

FIGURE: 3 smoking habit data

Smoking is the one of the main problem of all respiratory diseases ,smoking will leads to COPD, breathing difficulties and more over it will leads to cancer From the above figure 3 shows that 44.2% patients are smokers and 55.8% are non smokers .It means 258 patients are non smokers and 204 patients are smokers. From the above figure we can analysis that smokers are easily affect pneumonia than non smokers

Alcoholic habit patient data

Now days peoples know the adverse effect alcohol .Then also some peoples are used alcohol and alcohol containing beverages.

Table 4: Alcoholic habit patient data

Alcohol habit	N=462	Percentage to total
Alcoholic patients	97	21%
Non alcoholic patients	365	79%

In my study I have to collect alcohol habit of patients .The table shows that 97 patients are alcoholic and 258 patients are non alcoholic among the 462 patients

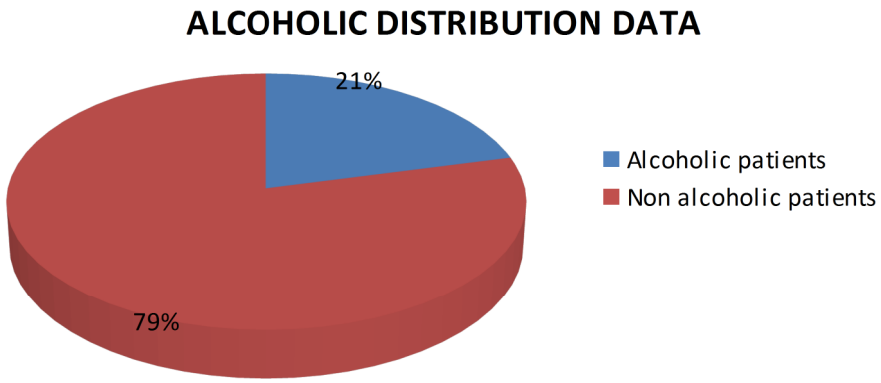

Figure 4: Alcoholic habit patient data

From the above figure 4 shows that 21% patients are alcoholic and 79% patients are non alcoholic from the total of 462 patients

Patient distribution data

Bronchopneumonia is a easily spreading diseases and without medical treatment it will lead to death pneumonia mainly affected in small children. Pneumonia occurred in approximately 156 million children, 151 million in the developing countries and 5 million in the developed countries

Table 5 : Patient distribution data

Patent details	N=462	Percentage to total
In patient	170	36.8%
Out patient	292	63.2%

In my theses work I collected 462 pneumonia patients' details. For this study I have to collect both in patients and out patients. The table 5 shows the demographical data of the study conducted. It was noted that out of the 462 patients were part of the study differentiate in inpatients and outpatients

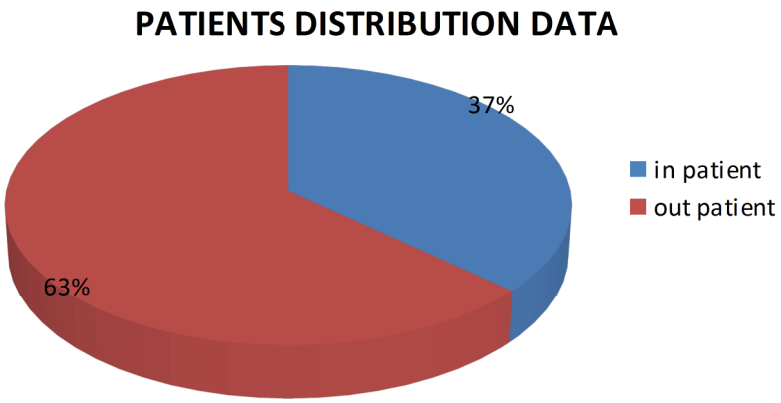

Figure 5 : Patient distribution data

From the above figure 5 shows that out of 462 patients 292 are out patients its comes around 63.2%and 170 are in patients and its comes around 36.8%.From the above figure we can understand that initial stage of pneumonia patients are ready for treatment then pneumonia is easily curable and avoid hospital admitting .Some patients are avoid to consult physician and the disease become chronic then only they are ready to meet doctors .this condition patients may needs to intravenous administration of antibiotics .so they must be in hospital as a inpatient

Anti microbial prescription data

Pneumonia is respiratory diseases mainly affected in lungs. So antimicrobial therapy is essential for treating pneumonia, antimicrobial agents will fight to pneumonia causing organisms and easily cure from the infections

Table 6: Anti microbial prescription data

Anti microbial prescription data	N=462	Percentage to total

Number of patient with antimicrobial prescription	462	100%
Number of patient without antimicrobial prescription	0	0

In this table shows that number of patients taken antimicrobial drugs for bronchopneumonia

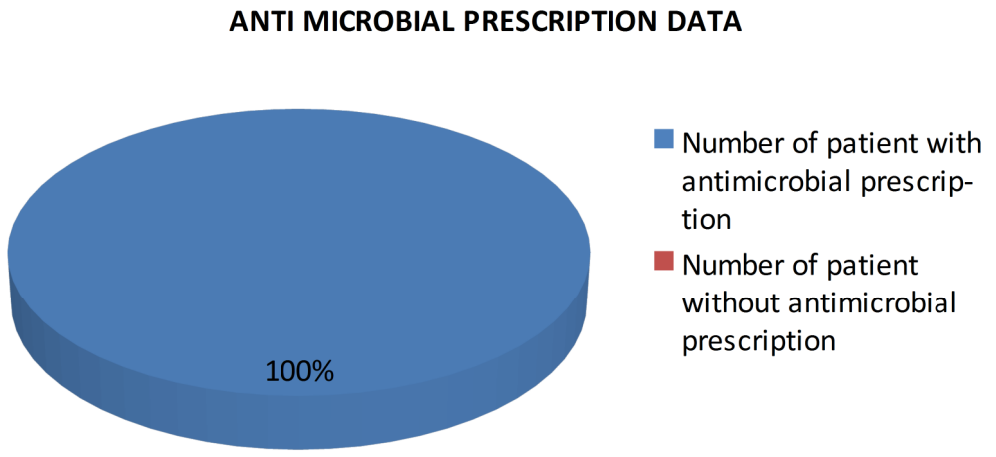

Figure 6: Anti microbial prescription data

Bronchopneumonia is a major cause of death among all age groups resulting in 7% of the world's total death rate. Anti microbial therapy is essential for the treatment for curing the disease .from the above figure 6 shows that all the 462 patients got antimicrobial prescription. It means 100% . Most cases of pneumonia can be treated without hospitalization. Typically, oral antibiotics, rest, fluids, and home care.

Hospital wise distribution data

For my theses work I collected data's from two hospitals Shankar hospital cherpulassery in palakkad districted ramdas clinic and nursing home perinthalmanna in malapuram district kerala

Table 7: Hospital wise distribution data

Name of hospital	N=462	Percentage to total
Shanker	267	57.8%
Ramdas	195	42.2%

For my study I collected dates from two hospitals. A total of about 462 patients were selected for this study. The table 7 shows the demographical data of hospitals. It was noted that out of the 462 patients who were part of the study 267 were from shanker hospital cherpulasery and 195were in the hospital of ramdas polyclinic and nursing home perinthalmanna

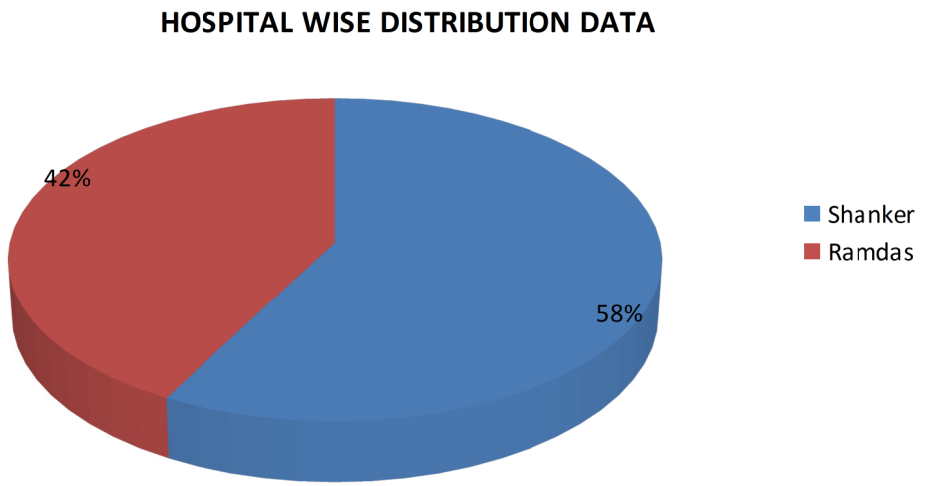

Figure 7: Hospital wise distribution data

From the above figure shows that 57.8% of patients from Shankar hospital and 42.2% of patients from Shankar hospital perinthalmanna

Cost range of antimicrobial prescription

Table 8: Cost range of antimicrobial prescription

Cost range	number of in Patient	number of out Patient	N=462	Percentage to total
1-200	0	72	72	15.6%
201-400	0	172	172	37.1%
401-600	0	38	38	8.2%
601-800	0	10	10	2.2%
801-1000	0	0	0	0
1001 and above	170	0	170	36.9%

From the above table different cost range anti microbial prescriptions .the cost of anti microbial are differ from patients and severity of the disease .and the cost will wary from in patients and out patients .In case of in patients the cost will high compare to out patients

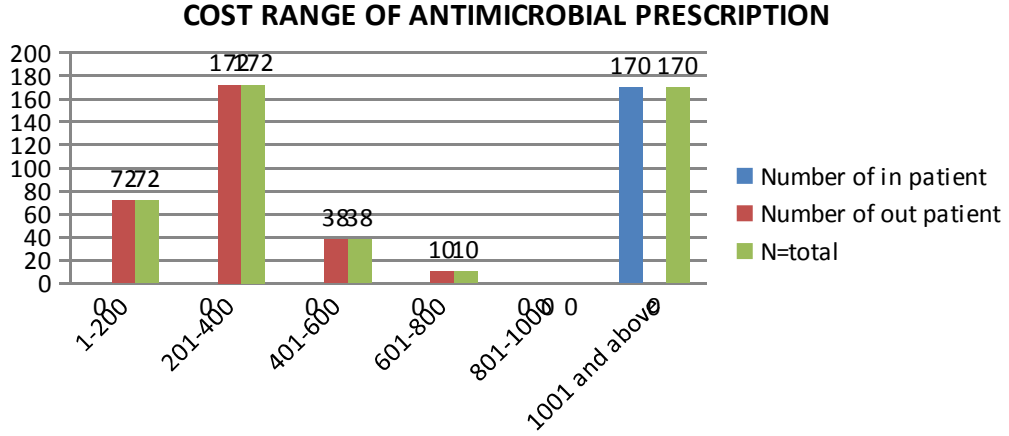

Figure: 8 Cost range of antimicrobial prescription

From the above figure 8 shows that we can easy find out different cost range and its percentage of anti microbial prescription for both in patients and out patients .The cost range from 0-200 of anti microbial prescription is around 72 patients and the its comes 15.6% of total patients. The cost range from 201-400antimicrobial prescription is around 172 patients and its comes around 37.2 %of total patients. the cost range from 401-600 prescription is around 38 patients and the percentage of total is 8.2.the cost range from 601 -800 antimicrobial prescription is 10 patients and its around 2.2%.the cost range 801-1000are nil .and the cost more than 1001 is around 170 patients and its comes 36.8% of total bronchopneumonia patients .From the above figure we can understand that in patients antimicrobial prescription are more costly than out patients prescription.

Total cost range of orals

Table 9:Total cost range of oral

Range	In patient	Out patient	N=462	Percentage to total
1-200	0	2	2	0.4%
201-400	8	50	58	12.6%
401-600	85	209	294	63.6%
601-800	61	31	92	19.9%
801-1000	16	0	16	3.5%
1001 and above	0	0	0	0%

From the above table different cost range orals in the prescriptions .the cost of orals are differ from patients to patients and severity of the disease .and the cost will wary from in patients and out patients and duration of treatment

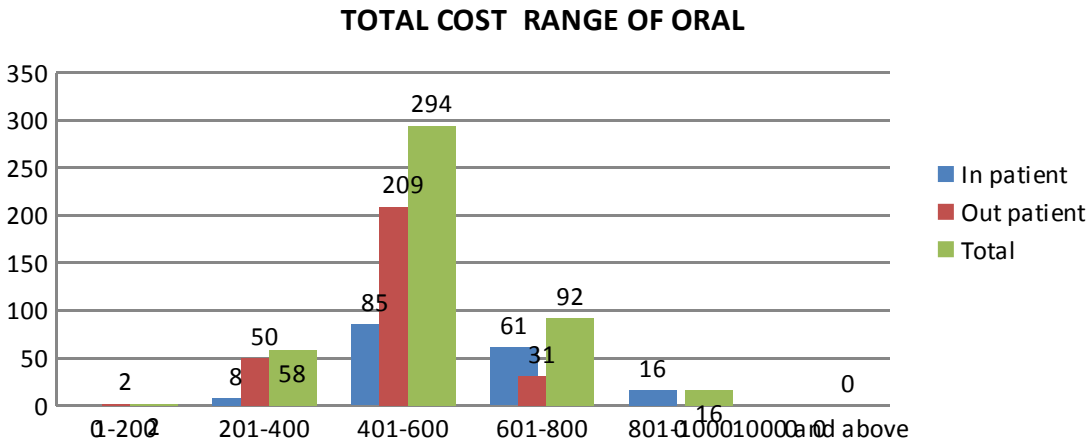

Figure 9: Total cost range of orals

From the above figure 9 we can easy find out different cost range and its percentage of oral prescription for both in patients and out patients .The cost range from 0-200 of orals prescription is around 2 patients and that its comes 0.4% of total patients. The cost range from 201-400 of orals is 58 patients and that is comes 12.5% of total patients. The range from 401-600 of orals is 294 patients and that is comes 63.3 % of total patients. The range from 601 to 800 of orals is 92 patients and that is comes 19.9% of total patients. The range from 801 to 1000 of orals is 16 patients and that is comes 3.5% of total patients. More than 1001 range oral usage prescription is nil. From the above figure we can find out 401-600 range patients are taking orals than all other range

Total cost range of injections

In case of bronchopneumonia patients injections are prescribed for all Inpatients because antibiotics are administered through intravenous administration

Table 10: Total cost range of injections

Total Cost Range	In patien t	Out patients	N=462	Percentage to total
0-1000	0	0	0	0
1001-2000	2	0	2	1.2%
2001-3000	85	0	85	50%
3001-4000	25	0	25	14.7%
4001-5000	41	0	41	24.1%
5001-6000	0	0	0	0
6001-7000	0	0	0	0
7001-8000	16	0	16	9.4%
8001-9000	1	0	1	0.6%
9001-10000	0	0	0	0

From the above table different cost range injections in the prescriptions .the cost of injections are differ from patients to patients and severity of the disease.

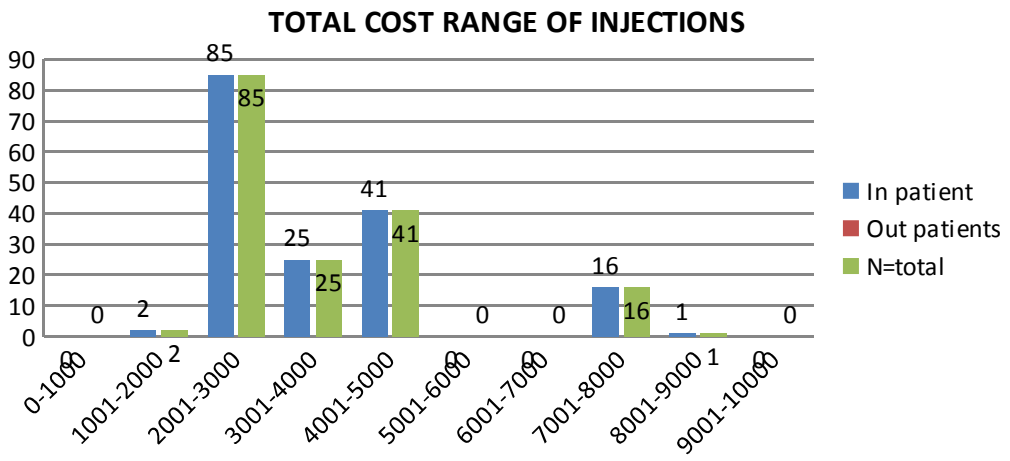

Figure 10: Total cost range of injections

From the above figure 10 shows that we can easy find out different cost range and its percentage of injections .The figure shows that injections are prescribed only for inpatient not prescribed for outpatients .The cost range from 0-1000 of injections prescription is zero. The cost range from 1001-2000 injections is around 2 patients and its comes around 0.3 %of total patients. the cost range from 2001-3000 prescription is around 85 patients and the percentage of total is18.5%.The cost range from 3001 -4000 injections in the prescription is 25 patients and its around 5.4%.the cost range 4001-5000 injections in the prescriptions is41patients and its around 8.9% .The cost range from5001-6000 of injections prescribed for the patients is zero . The cost range from6001-7000 of injections

prescribed for the patients is zero .The cost range from 7001-8000 injections prescribed for the pneumonia patients is around 16 patients and its comes around 3.5 %of total patients. the cost range from 8001-9000 prescription is around 1 patients and the percentage of total is0.2%.The cost range from 9001 -10000 injections for the patients is zero. From the above figure we can easily find out 2001-3000 range of injections are prescribed more compare to other range.

Total cost range of other route(Evoheller)

Now a day's evoheller are prescribed for respiratory tract infectious disease like pneumonia and COPD. Commonly used evoheller are corticosteroids ,in the tablet or oral dosage form it will shows more adverse drug reactions .To overcome this unwanted reactions they are prescribed in the form of evoheller.

Table11: Total cost range of other route (evoheller)

Total cost range	In patient	Out patient	N=462	Percentage to total
0-100	0	6	6	1.3%
101-200	0	0	0	0%
201-300	60	43	103	22.3%
301-400	8	2	10	2.2%
401-500	72	30	102	22.1%
501-600	0	0	0	0

Bronchopneumonia is affected in lungs so that respiration difficult may be occur in most of the patients .Doctors are prescribed evoheller along with antibiotics and orals .The above table 11 shows thevohaller usages

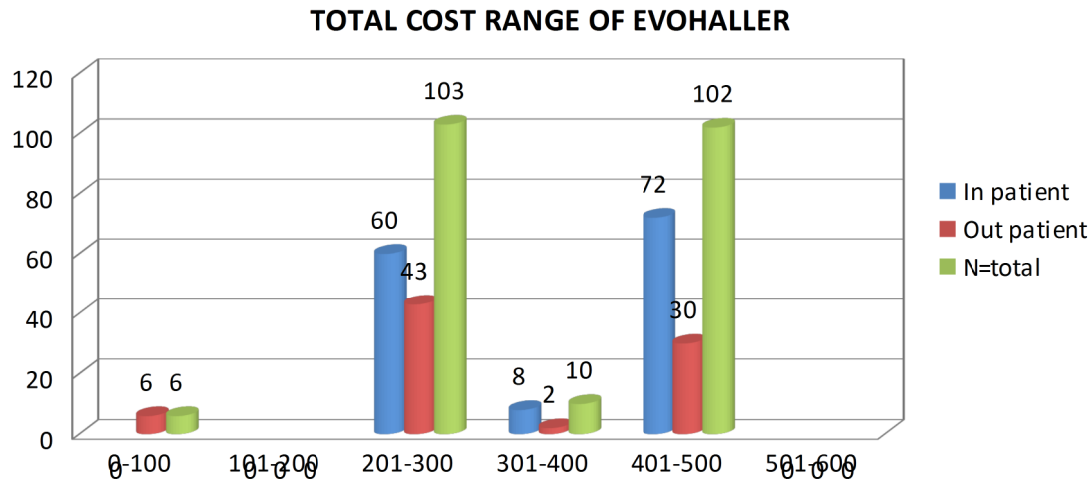

Figure 11: total cost range of other route

The above figure 11 shows the cost range of evoheller and from above figure we can easily find out different cost range and number of prescription in each range and its percentages

The cost range from 0-100 shows that 6 patients and its comes around 2.7 percentage of total prescriptions. The cost range from 101-200 is zero. The cost range from 201-300is 103 and the percentage of total is 22.3. The cost range from 301-400 shows that 10 patients and its comes around 2.2 percentage of total prescriptions. The cost range from401-500 shows that 102 patients and it's comes around 22.1 percentage of total prescriptions. The cost range from 501-600 is zero. From the above figure we can easily find out that total number of inpatients used

evoheller are 140 and out patients taken evoheller are 81 total number of patients taken evoheller are 221 .48%of patients taken evoheller out of 462 patients

Total medical cost range

Table 12: Total medical cost range

Total Medical cost range	In patient	Out patients	N=462	Percentage to total
0-200	0	0	0	0
201-400	0	32	32	6.9%
401-600	0	79	79	17%
601-800	0	116	116	25.1%
801-1000	0	32	32	6.9%
1001-1200	0	33	33	7.3%
1201 and above	170	0	170	36.8%

From the above table mentioned total medical cost for both in patients and out patients and over all percentages of all 462 patients

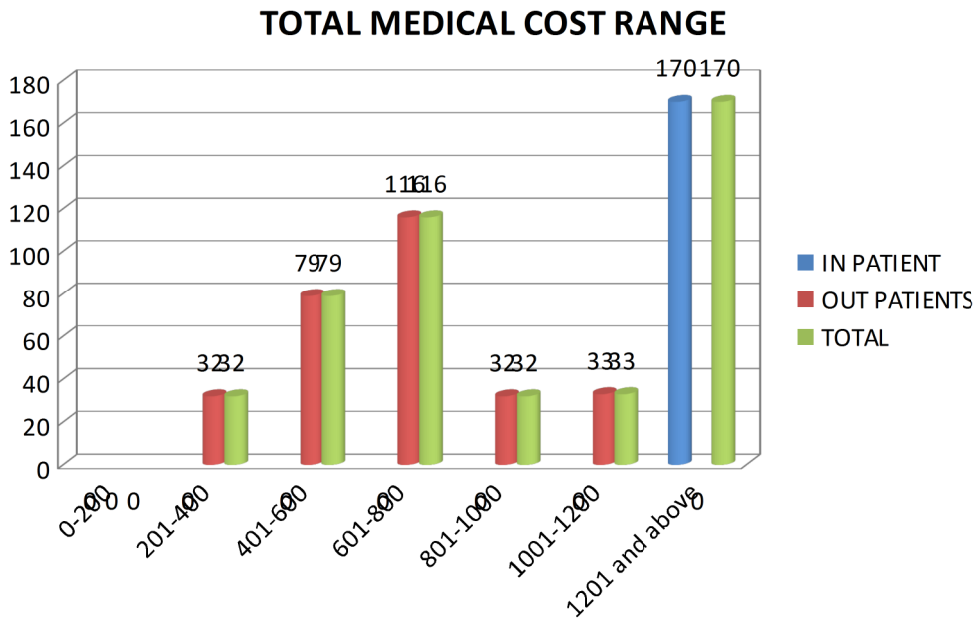

Figure 12: Total medical cost

The above figure 12 shows the total medical cost and from above figure we can easily find out different cost range and number of prescription in each range and its percentages The medical cost range from 0-200 shows nil .The cost range from 201-400 is 32patients and its comes around 6.9%of over all patients. The cost range from 401-600is 79 and the percentage of total is 17.1. The cost range from 601-800 shows that 116 patients and its comes around 25.1percentage of total prescriptions. The cost range from 801-1000 is 32patients and its comes around 6.9%of over all patients. the cost range from 1001-1200is 33 and the percentage of total is 7.1. All the above mentioned patients are out patients. The cost range from1 201 and above is 170patients and its comes around 36.8%of over all patients. From this figure we can understand that in patients have more medical cost than out patients. All the in patients medical cost is more than the last range that is 1201 and above.

Total non medical cost

Table 13: Total non medical cost

Range	In patients	Out patients	N=462	Percentage to total
1-200	0	0	0	0
201-400	0	131	131	28.5%
401-600	0	160	160	34.6%
601-800	0	1	1	0.2%
801-1000	0	0	0	0
1001 or above	170	0	170	36.7%

From the above table mentioned total non medical cost for both in patients and out patients and over all percentages of all 462 patients

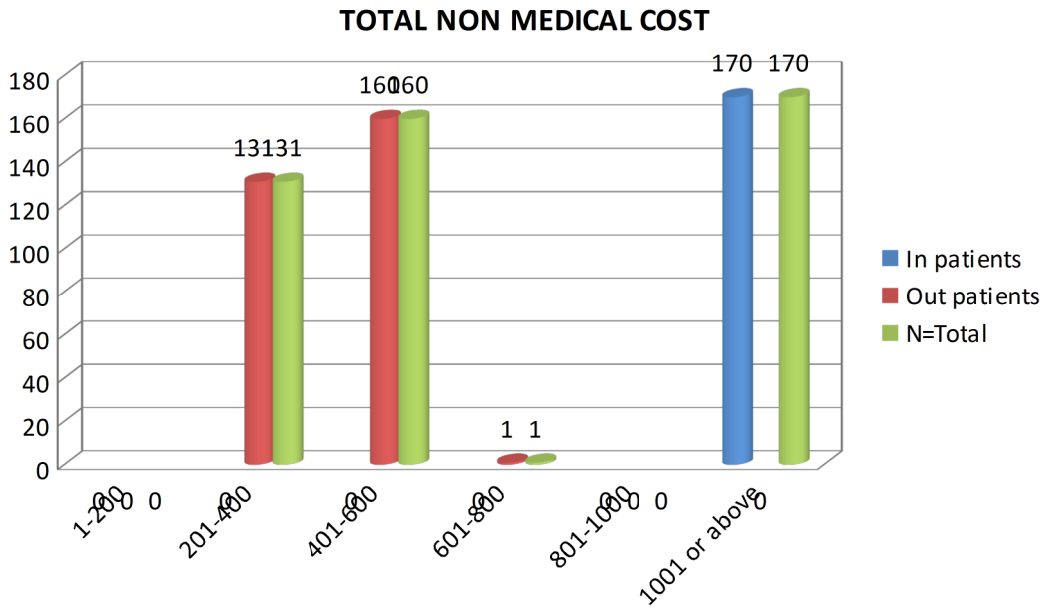

Figure 13: Total non medical cost

The above figure 13 shows the total non medical cost and we can easily find out different cost range and number of prescription in each range and its percentages The non medical cost range from 1-200 shows nil .The cost range from 201-400 is131patients and its comes around 28.5%of over all patients. the cost range from 401-600is 160 and the percentage of total is 34.6. The cost range from 601-800 shows that 1 patient and itscomes around 0.2percentage of total prescriptions. The cost range from 801-1000 is zero. All the above mentioned patients are out patients. The cost range from1 001 and above is 170patients and its comes around 36.8%of over all patients. From this figure we can understand that in patients has more non medical cost than out patients. All the in patients non medical cost is more than the last range that is 1201 and above.

Total cost range

Table 14: Total cost range (Medical + Non medical)

Total Cost range	In patient	Out patient	N=462	Percentage to total
1-1000	0	73	73	15.8%
1001-2000	0	217	217	47.0%
2001-3000	0	2	2	0.4%
3001-4000	0	0	0	0%
4001-5000	2	0	2	0.4%
5001-6000	28	0	28	6%
6001-7000	29	0	29	6.2%

7001-8000	6	0	6	1.3%
8001-9000	20	0	20	4.3%
9001-10000	29	0	29	6.3%
10001 and above	56	0	56	12.1%
Total	170	292	462	100%

From the above table 14 mentioned total cost it means medical +non medical cost for both in patients and out patients and over all percentages of all 462 patients

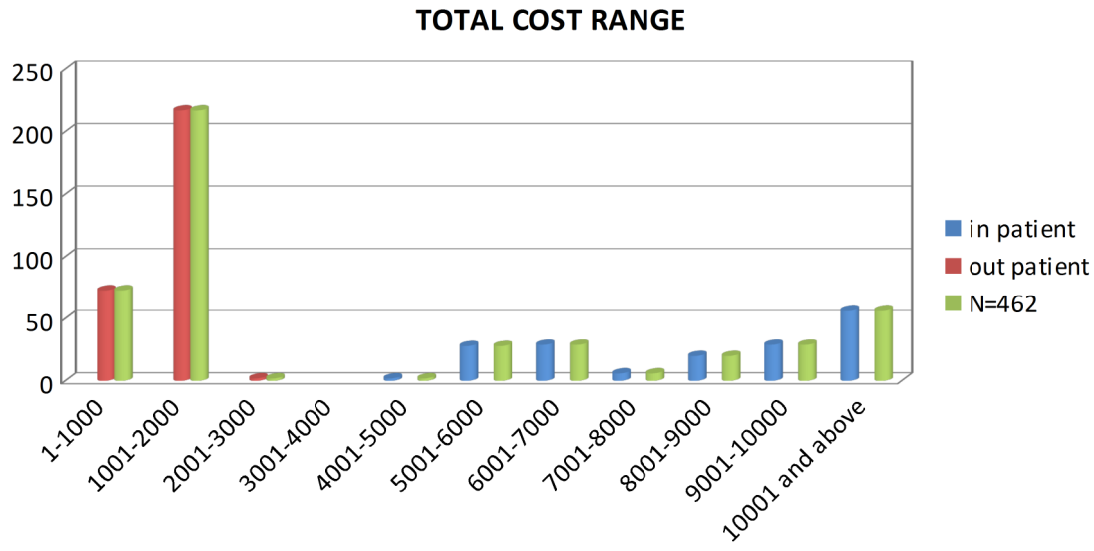

Figure 14: Total cost range

From the above figure 14 we can identified total cost of a patients including medical and non medical cost .non medical cost including lab testing, x-ray investigation reports ,traveling expenses, in case of in patients room rent also included in this ,doctor fee, food expenses and other expenses .From the above figure we can find out different range of expenses and number of patients in each group.

The total cost range from 1-1000 shows 73patients and its comes around 15.8% .The cost range from 1001-2000 is217patients and its comes around 47% of overall patients. the cost range from 2001-3000is 2 and the percentage of total is 0.4%.All this three ranges are only out patients . The cost range from 3001-4000 is nil. The cost range from4001-5000 shows that 2 patient and its comes around 0.4percentage of total prescriptions. The cost range from 5001-6000 is 28 pneumonia patients and it comes around 6%of total. The cost range from 6001-7000 is 29 patients and its comes around 6.2%of over all patients. The cost range from 7001-8000is 6 and the percentage of total is 1.3%. The cost range from 8001-9000 is 20 patients and its comes around 4.3%of over all patients. the cost range from 9001-10000is 29 and the percentage of total is 6.3%. The cost range from10001 and above is 56patients and the percentage of total is 12.1%The above seven ranges shows only in patients and not out patients .so we can find out that in patients have more total expenses compare to out patients.

Prescription days range

If the patients start medication at initial stage and physician find out the actual disease condition of the disease then the duration of medication is may be

little 5 to 7 days, but most of the patients are not care about health .Depending up on the severity of patient disease condition the number of prescription days will be vary

Table 15: Prescription days range

Days range	N=462	Percentage to total
0-3	0	0
4-6	4	0.9%
7-9	38	8.2%
10-12	418	90.5%
12-15	2	0.4%
16 or above	0	0%

From the above table 15 shows that number of days prescribed the medicine for pneumonia patients. The days will be change the severity of pneumonia

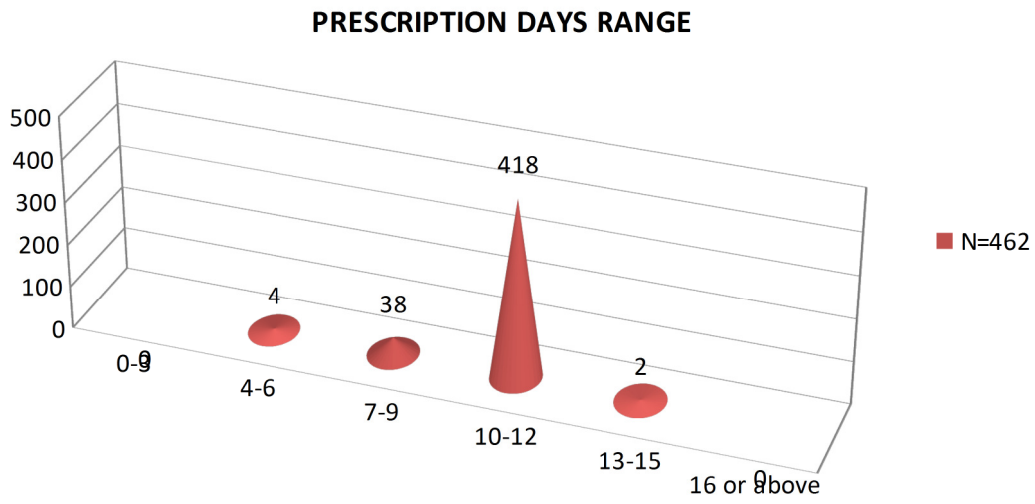

Figure 15: Prescription days range

From the above figure we can easily find out the prescription days range of all the patients and number of range of all the patients and percentage of each range. The range from 0-3 shows zero priscription,4-6 shows 4patients prescription and its comes around 0.9%, the range from 7-9 shows 38 patients and its comes around 8.2%, the range from 10-12 shows 418 patients and its comes around 90.5%, the range from 13-15 shows 2 patients and its comes around 0.4%,and more than 16 days prescription zero. From this figure we can understand 10-12 days of prescription is more than all other range

Total treatment cost per day

The average cost of bronchopneumonia treatment is varying from patient to patient. Treatment duration also vary from severity of disease. In case of inpatients they have more treatment expenses than out patients; intravenous drugs are more expensive than orals.

Table 16: Total treatment cost per day

Cost range/day	N=462	Percentage to total
0-99	125	27.1%
100-199	167	36.2%
200-299	0	0
300-399	0	0
400-499	27	5.8%

500-599	33	7.2%
600-699	11	2.4%
700-799	35	7.6%
800-899	14	3%
900-999	38	8.1%
1000 and above	12	2.6%

From the above table 16 shows the average cost per day for pneumonia patients. The cost will be change the severity of pneumonia, and type of patient details it means in patients and out patients

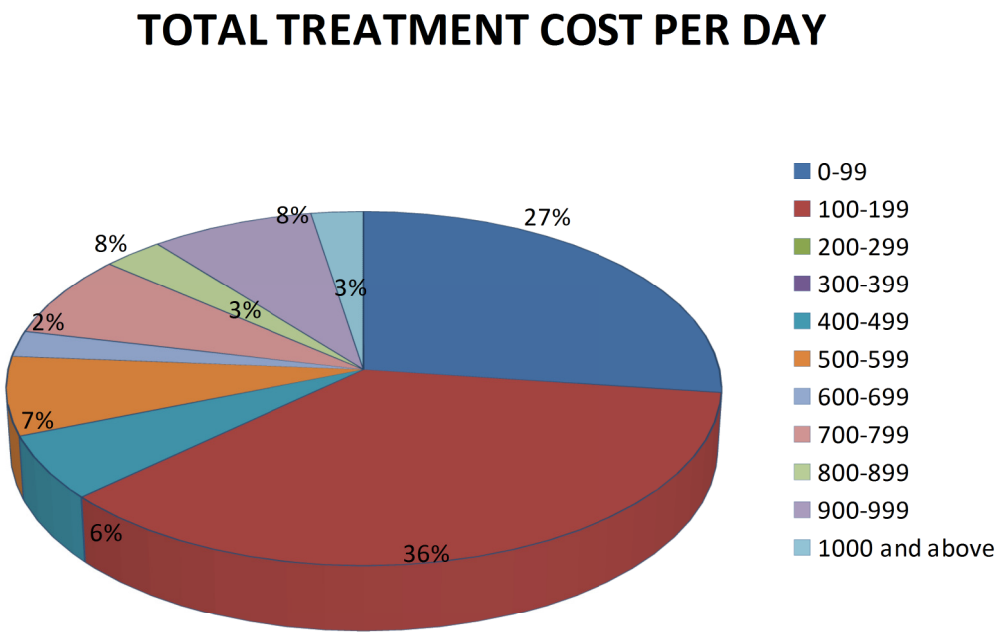

Figure 16: Total treatment cost per day

The above figure shows that different cost range per day of all bronchopneumonia patients the ranges are vary from patient to patients and severalty of patients. the range from 0-99 is 125 patients and its comes around 27.1%, the range from 100-199 is 167 patients and its comes around 36.2%, the range from 200-299 is zero ,the range from 300-399 is also zero, the range from 400-499 is 27 patients and its comes around 5.8%, the range from 500-599 is 33 patients and its comes around 7.2%, the range from 600-699 is 11 patients and its comes around 2.4%, the range from 700-799 is 35 patients and its comes around 7.6%, the range from 800-899 is 14 patients and its comes around 3%, the range from 900-999 is 38 patients and its comes around 8.2% and the range more than 1000 is 12 and its percentage is 2.6% ,from this we can find out that in patients have

more prescription cost than out patient per days prescription, because in patients should pay the hospital room rent and laboratory tests

Anti microbial drugs prescribed in various prescription

Bronchopneumonia is the one of the major cause of death among all age groups resulting in 4 million death yearly. Rates are higher in children less than five, and adults older than 75 years Antibiotics for bronchopneumonia include third- and fourth-generation cephalosporins, carbapenems, fluoroquinolones, amino glycosides, and vancomycin. These antibiotics are usually givenaoral and intravenously. Multiple antibiotics may be administered in combination in an attempt to treat all of the possible causative microorganisms. Antibiotic choices vary from hospital to hospital and patient to patients because of regional differences in the most likely microorganisms, and because of differences in the microorganisms' abilities to resist various antibiotic treatments

Antibiotic treatment is essential for the for pneumonia otherwise it will leads to chronic obstructive pulmonary disease and will leads to death

Physicians prescribe antibiotics for pneumonia depending up on the severity and also patient body nature

Table 17:Anti microbial drugs prescribed in various prescription

Antimicrobial drugs	Route		N=462	Percentage to total
	Oral	Injections		
Procaine penicillin	0	9	9	1.9%
Cefuroxime	0	15	15	3.2%
Ciprofloxacin	16	0	16	3.5%
Amoxicillin	26	0	26	5.6%
Levofloxacin	28	0	28	6%
Cefotaxime	0	47	47	10.2%
Amikacin	0	54	54	11.7%
Cefixime	60	0	60	12.9%
Meropenam	0	60	60	12.9%
Doxycyclin	61	0	61	13.2%
Ceftriaxon+tazobactum	0	71	71	15.4%
Amoxicillin+potasium clavulanate	92	0	92	19.9%
Azithromycin	160	45	205	44.4%

The above table shows that different antimicrobials prescription in each and every patients. This also shows the route of anti microbial prescriptions for pneumonia patients

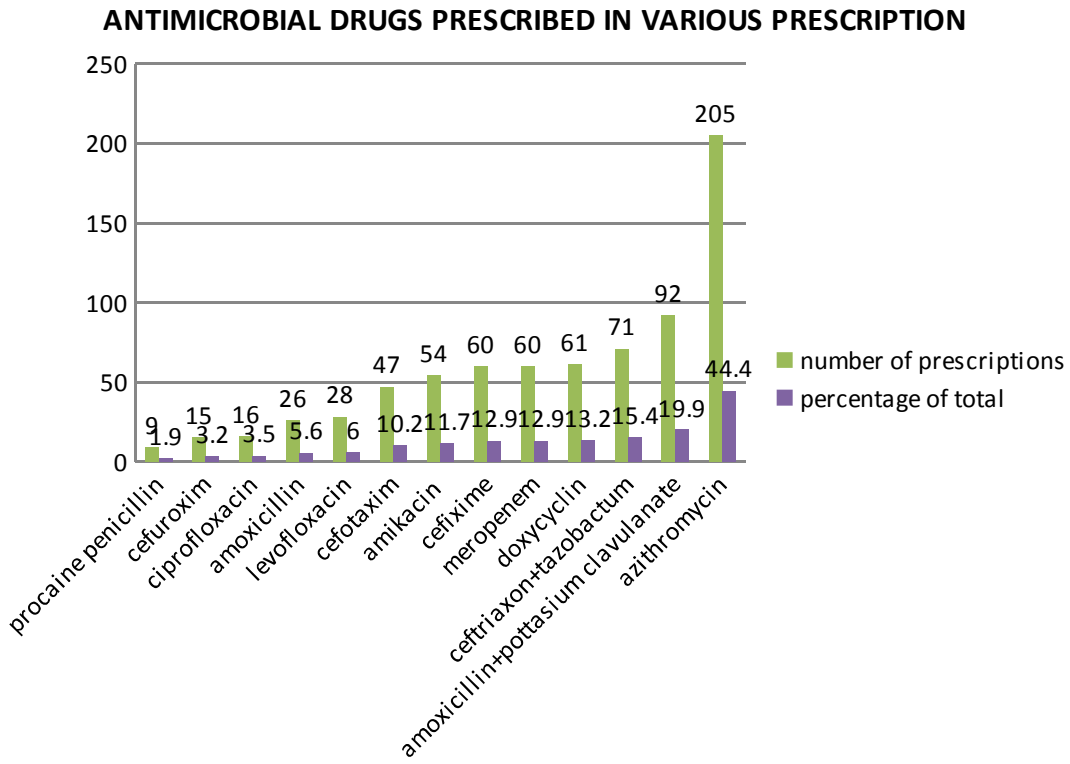

Figure 17: Antimicrobial drugs prescribed in various prescriptions

From the above figure 17 shows that all the anti microbial prescribed for bronchopneumonia patients, route and number of antimicrobials in each prescription. The figure shows that procaine penicillin is prescribed for 9 patients in intra venous route of administration this is around 1.9% of total prescription. Cefuroxime is prescribed for 15 patients in intra venous route of administration this is around 3.2% of total prescription, Ciprofloxacin is prescribed in 16 prescription

in oral route this is 3.5 percentage of total prescription, amoxicillin is prescribed in 26 prescription in oral route this is 5.6 percentage of total prescription ,Levofloxacin is prescribed in 28 prescription in oral route this is 6.0 percentage of total prescription, Cefotaxime is prescribed for 47 patients in intra venous route of administration this is around 10.1% of total prescription, . Amikacin is prescribed for 54 patients in intra venous route of administration this is around 11.7% of total prescription, Cefixime is prescribed in 60 prescription in oral route this is 12.9 percentage of total prescription , Meropenam is prescribed for 60 patients in intra venous route of administration this is around 12.9% of total prescription , Doxycyclin is prescribed in 61 prescription in oral route this is 13.2 percentage of total prescription, Ceftriaxon and tazobactum combination is prescribed in 71 prescription in intra venous route this is 15.4 percentage of total prescription, Amoxicillin and potassium clavulanate combination is prescribed in 92patients this 19.9%of overall prescription, Azithromycin is prescribed for 205 patients in both oral and intra venous route of administration this is around 44.4% of total prescription,

From this study I find out that Azithromycin is more prescribed antibiotic and procaine penicillin is less prescribed antibiotics for bronchopneumonia in my study.

CONCLUSION

This observational study is "to evaluate antimicrobial prescription trend and direct cost analysis of various drug prescribed for bronchopneumonia", the study concludes that patients age wise demographic data shows that 31.2% patients are in the age group of 31-40 out of 462 patient 144 patients are the above age group .Gender wise demographic data shows that 292 pneumonia patients are male and a170 patients are females in my study. Smoking habit distribution data shows that 204 patients are smoker its comes around 44.2% total study population .smokers are easily affect pneumonia according to standard guidelines .Anti microbial prescription data shows that 100% patients are got antimicrobial prescription because pneumonia totally recovered from the patient body by the use of antimicrobial administration . For the theses work I collected details from two hospitals, it shows 267 patients from shanker hospital and 195 patients from ramdas hospital

Cost range of antimicrobial prescription is different in each every patient in my study shows that 36.9 patients have more than 1000 rupees for antibiotics ,and all this patients are inpatients and 37.1% of patients have anti biotic cost range from 2001-400 all this patients are out patients and its 172 patients

Orals route of drugs such as antibiotics and other oral drugs are such as tablets and syrups cost range vary from patient to patients in my study shows that 294 patients are in the range of 401-600 cost range its 63.6% of total study population .

In my study cost range of injections only for out patients not for in patients because in my study only inpatients are taken injections .it shows that 85 patients are taken injections in the range of 2001-3000 ,and 25 patients taken in the cost range of 3001-4000.

Cost range of evoheller is taken in this study it shows that 221 patients are taken evoheller it include both inpatients and out patients from this 103 patients are taken the evoheller in the range of 201-300 and it is 22.3 %of total study population

In this study I collect total medical cost range of each and every patient in my study ,out of 462 patients 170 patients have more than 1201 cost range ,and all those patients are out patients .in case of out patients ,116 patients medical cost is in average 601-800 its around 25.1% of total patients.

In this theses' work I collected non medical cost of the patient it shows that 201-400 cost range of patients are 131, 401-600 range patients are 160 its around 34.6%and 1001 or more range are 170 it s around 36.7% over all patients all the 170 patients are in patients.

For understanding total cost of prescription I combined with total medical cost and non medical cost, it shows that 47% of patients are come in the range of 1001-2000, all this patients are out patients and in case of in patients 56% of patients are the cost range of 10001 and above. All the inpatients range is started from 4001-10001 and above,but in case of in patient range is 1-1000 to 3000.

For this study I collected number of days of prescriptions details of all the patients. The number of days will vary from severity of patients. It shows that 418

patents are in the range of 10-12 days of prescription, it means 90.5% of my study populations patients are in the range of 10-12 days range.

Average cost of each prescription was find out in the study it shows that 167 patients have the range 100-199 and 125 patients have the range from 0-99,its comes around the percentage 36.2 and 27.1 respectively and all the above mentioned is out patients details only. In case of in patients ranges from 400-499 to 1000 and above,in this 38 patients are range from 900-999.

Finally I collected different type of antibiotics used for pneumonia, antibiotics are prescribed according to patients diseases condition. From my study 16 different antibiotics are prescribed .and my study shows that Azithromycin was more prescribed that is 204 antibiotic prescriptions .and then the combination of amoxicillin with pottasium clavulanate is around 92 prescriptions. The study shows that out of 462 pneumonia patients 744 antibiotics are prescribed, that is both in the form of orals and injections.

I conclude the study, Antibacterial prescription trend in bronchopneumonia, cost of antimicrobial prescription in bronchopneumonia and total treatment cost of bronchopneumonia was understood and Medical cost involved in treating bronchopneumonia and non medical cost involved in treating bronchopneumonia was studied.

LIMITATIONS OF THE STUDY

Antimicrobial prescription trend and direct cost analysis of various drug prescribed for bronchopneumonia which is done from valluvandu area in kerala, I have done this theses in proper way but some limitation persist there

Some of the limitations are:

- Number of patients isless, large number of patients arerequired for this study.
- It's only limited to bronchopneumonia patients.
- This is only a observational study but a detailed study is required.
- Prescription details from the age limit of 10-75 years is collected for this study, Pediatric and geriatric patients apart from this age range are not included in this study.

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